

Reactions to U.S. economic measures

Rates may fluctuate widely as London reopens to-day

Israel devalues its pound by 20% against the dollar

IN BRIEF

CANADA'S Prime Minister Pierre Trudeau said in a broadcast: "A weak Canadian economy is a help to the United States. We cannot sit idly by and watch the impact of the U.S. surplus, which if it continues in effect against Canada, will hurt us more than any other country."

However, he said Canada has no intention of retaliating because this could set in motion a trade war.

AUSTRIA'S foreign exchange market will remain closed today, similar to Switzerland's. This decision was taken at a special meeting in the Austrian Finance Ministry last night.

INDIA'S rupee-sterling parity will be allowed to vary according to the dollar-sterling rate on the London market, the Indian Government announced.

STOCKHOLM—The Government announced tonight that a foreign currency dealing will resume in Sweden and that the value of the krona will be altered.

DANISH National Bank said it is not changing the Danish krone against the dollar, but will suspend the 7.4638 intervention rate for buying dollars until further notice.

NORWAY'S Government will announce details to-day of the measures it has adopted to maintain renewed trading in foreign currencies. Mr. Per Kleppe, Minister of Trade, said the Government anticipated the value of the krone would rise "to a certain extent."

NEW ZEALAND Reserve Bank governor Mr. Alan Low said New Zealand banks will continue limited dealings in foreign exchange to-day.

INDONESIA'S Central Bank will reopen to-day after being closed since last Tuesday.

BY MICHAEL BLANDIN

FOREIGN exchange markets reopen in London to-day in an atmosphere of confusion. Business is expected to be hectic and rates may fluctuate widely as the attempt to get to grips with the uncertainties of an entirely new situation.

The decision to allow the pound to float upwards, announced late on Friday, was widely anticipated, and gave the market a week-end to consider some of its implications. The banks welcome the reopening of the market after its five-day closure. But they are conscious that there is a wide area of doubt over the implications of the various policies adopted by individual countries to deal with the dollar crisis.

Official rate
Freed from the restraint of official intervention at the upper limit, the pound is expected to move upwards against the dollar. Based partly on the rates ruling in the New York market towards the end of last week, it is thought in official circles that sterling may establish a rate of around \$2.45-\$2.47, an effective revaluation of 2-3 per cent. from its par value of \$2.40, which remains officially in force.

The working of the market will depend to a considerable extent on the tactics adopted by various national authorities once the situation settles down, and on the co-ordination of central bank intervention. While the U.K. has abandoned the former top limit of \$2.42 for the pound, there is nothing to stop the Bank of England from stepping in to steady the rate or even perhaps to limit the size of the upward movement in the pound.

The London market is likely to be faced with a substantial volume of business for normal trading purposes as companies catch up on the backlog left by last week's closure.

Though dealers are therefore anxious to get back to work, they recognise a number of difficulties. One is the sheer unfamiliarity of the situation. Few have any real experience of a situation in which most of the major currencies are free to move against each other, and in Britain it is possible only to look back to the experience of the 1930s.

Another problem which will be faced both by the financial markets and by many large international companies is to reconcile the central position of the dollar as a world trading currency with its floating value.

Through the Eurocurrency markets the dollar is by far the most important currency used in international capital movements. And, as the one effective reserve currency in the past, it has been widely used by international companies as a basic unit of account in, for example, the oil and shipping industries.

Industry and commerce generally also expect problems in dealing with the wider movements in exchange rates possible under a floating system. Some at least of Britain's exporters and importers are likely to find some misgiving, arguing that the situation adds yet one more uncertainty to their trading activities.

Once the system has settled down, it is recognised, the floating rate need not imply that movements in exchange will be substantially larger than previously. The large international companies, moreover, tend to have some buffer against any exchange risk.

It is hoped that if the situation lasts for any length of time, the forward markets in the major currencies will expand to accommodate the possible extra demand, and that it may be possible at not too great a cost to get forward periods than has been normal in the past, when anything for a year or longer has often been difficult to obtain.

Looking further ahead however, the American 10 per cent. import surcharge is likely to give an additional sense of urgency to the high level international committee on trade matters agreed to at the last OECD Ministerial meeting in June.

In the meantime, full details have become available of the French Government's two-tier foreign exchange market, due to open to-morrow morning.

As expected, the official market, supported by Central Bank intervention, will be used for present fixed parities, currency dealings for imports and exports, transport, insurance and other matters directly related to trade.

The morning after the unsuccessful meeting of Finance Ministers of the Six last week, M. Giscard d'Estaing sought to play down its implications, arguing that the meeting was only one step in a long process, and that it would have been unwise to expect sudden results from it. The next stage in this process will apparently be for the Germans to put forward a date for the proposed Brandt-Pompidou summit.

Sense of urgency
There was no sign here over the week-end of any fresh moves towards an immediate multi-lateral conference on the currency front, such as a meeting of deputies of the Group of Ten. The general feeling in monetary circles remains that there will be little for such a discussion to hit on until the markets have had their say on the relative values of currencies, though at a technical level central bankers will have a chance to review the situation at the Bank meeting of the European Monetary Agreement due to take place here this week.

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By Michael Southern, Australia Editor
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In effect, the three countries have decided to apply to themselves a proposal that they put forward for the Community as a whole during last week's meeting. In a communiqué issued at the week-end, the three Governments called for further Community discussions as soon as possible so as to establish a common position among all six countries which could also prove acceptable to the U.K.

Under the Benelux Plan, Belgium will retain its two-tier exchange market, but the Belgian franc will float against the dollar and all other currencies except the Dutch guilder in both markets—subject to intervention by the central bank on an unspecified point. The Belgian central bank is also responsible for the Luxembourg franc, which has the same parity as the Belgian franc.

The official parity of the Belgian franc will remain unchanged, and the basis of the monetary "bloc" will be a direct link with the Dutch guilder. In dealings between each other, Belgium and the Netherlands will fix the values of their currencies at the level which existed before the guilder began to float in May. The central bank will intervene to prevent the exchange rates of the two currencies getting more than 1.5 per cent. out of alignment with each other in either direction.

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Devaluation of the Israeli pound in relation to other currencies will be based on the relationship between the dollar and the particular currency concerned: in other words the Israeli pound will be devalued by between 25 and 30 per cent. in relation to some European currencies.

Essential
Announcing the measure Israel Finance Minister Pinhas Sapir declared that it had become essential to prevent unemployment as a result of increasing exports caused by the new American import surcharge and the consequent increased competition on third markets, particularly in Europe, where Israel is already handicapped by the Common Market tariffs.

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Israel's economy, namely, over-employment and consequent continuous pressure on all hands for higher wages and salaries. A number of measures accom-

panying the devaluation are therefore designed to prevent the possible benefits accruing from the devaluation being wiped out by an immediate price/wage rise spiral. Wages are to be frozen until collective agreements now in force expire, bank credit is not to be expanded, a levy equivalent to the percentage of devaluation is to be applied to all stocks on hand to prevent profiteering and controls are to be applied to prevent excessive price increases.

In contrast to previous devaluations (this is Israel's seventh within 15 years which has reduced the value of the currency from 1.50 to the dollar in 1952 to 14.20 to-day) staples will not be exempted from the price rises so that all sectors of the economy are affected. For this is clearly the second objective of the exercise—not only to maintain and develop exports but to cut imports of non-essentials and to reduce home demand in general not with a view to cutting down the import of raw materials for local production but to free production facilities for export.

Whether the Government will succeed in preventing a new surge of wages and prices in the present state of over-employment remains to be seen. The Finance Minister has already warned the country that if the devaluation is nullified by excessive price increases and a new wave of inflation, the Government will impose still further taxes in a desperate attempt to prevent the yawning trade gap—\$1,400m. per annum from widening still further.

\$22,000m. payments loss
BY JUREK MARTIN
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This estimate is contained in the usually accurate bulletin World Financial Markets, published by Morgan Guaranty Trust, the New York bank, and due for release to-morrow. Coming on top of a \$12,000m. deficit in the first half of this year, this means that the bank puts the official settlements deficit for the first 21 months of this year at \$22,000m.

The report estimates that the outflow probably reached \$2,500m. or more, July reversing the favourable direction taken by capital flows in June. In the first two weeks of August the deficit probably amounted to over \$7,000m.

More than half the \$22,000m. deficit recorded so far this year, about \$13,000m. was the result of short-term capital outflows prompted by currency uncertainties. About \$4,000m. can be attributed to the Japanese foodstuffs (the total outflow in this instance was probably about \$7,000m.).

Both the Government and the banks are eagerly awaiting the next set of economic indicators, covering especially employment and new orders, to see what is really happening to the economy.

If, as is likely, the reports show that activity is turning down, the Government at least has at its disposal nearly \$6,000m. from the repayable tax surcharge introduced last summer, and about another \$3,000m. which was taken out of the present budget and deposited with the Bundesbank. Both of these sums could be used, if necessary, for a process of refutation.

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The Technical Page

EDITED BY ARTHUR BENNETT AND TED SCHOETERS

RESEARCH

Low energy forming

SUPERPLASTICITY in a number of metals and alloys is no longer just a laboratory phenomenon. It is being applied on a production-line basis to the manufacture of aircraft shapes.

One complex part now being made from a zinc-aluminium alloy is a rather intricate bezel frame for a cathode ray tube and it has an integral attachment flange at the rear. It is shaped by applying air pressure to one side of the sheet of metal, stretched over a die cavity.

The part is formed within a minute and the part remains in the mould for a further four minutes to undergo a strengthening heat treatment. Preparation of the mould took six weeks or about a quarter of the usual time.

Other parts being made on a routine basis are a slotted lamp cover and a heat exchanger core, both rather difficult shapes to produce by any other method.

Further details of this work are available from the company at 1701 North Street, Endicott, New York 13760, United States.

INSTRUMENTS

Watch on pressure drops

IMMEDIATE alarm indication of a drop in flow rate below a preset level is provided by the in-line Rotameter type 2780 flow alarm by GEC-Elliott Process Instruments.

Type 2780 can be used in almost any application that needs constant monitoring of low flow conditions and is particularly suitable for cooling water circuits, such as those of large radio transmitting valves. The alarm is of simple design, is easy to install and requires a minimum of servicing. A simple quick release fixing enables the metering tube to be removed for cleaning without disconnecting the instrument from the pipe-work.

Three sizes of unit cater for any prespecified alarm flow rate from 41 to 8250 l/h water. A variety of contact materials is available and special models can be supplied for high pressures, high temperatures and for operation under sterile conditions.

Now, in an instrument to measure use of an electric typewriter, the meter can be re-set by moving its scale. The device will be installed by IBM service men to show when the typewriter has been used enough to require routine maintenance. Curtis Instruments of 300, Kisco Ave., Mt. Kisco, N.Y., U.S., supplies the meters to IBM.

At each maintenance call, the meter is reversed and its sliding scale set so the zero is over the gassing electrode. This gradually builds up, showing the hours of use on the scale. At any point, however, it can be reversed and the scale re-set to zero.

Measures strain

THE range of high-precision foil strain gauges manufactured by Environmental Equipments, Denton Road, Wokingham, Berks., has been expanded by 20 additional types.

Standard linear gauges are now available in lengths from 0.5 mm to 90 mm, and multi-element rosettes, including stacked rosettes, from 1 to 10 mm. The new gauges include a 50 x 10 mm, 120 ohm resistance linear gauge for heavy structures and "on site" applications; a 25 mm dia. four-element diaphragm gauge for pressure measurement; and gauges of various lengths suitable for detecting crack propagation in brittle fracture and fatigue failure investigations.

Selected lengths of linear gauges are available in the foil yield series which enable strains up to 20 per cent to be measured.

All gauges are encapsulated with short lead wires attached. The company supplies a full range of associated equipment, including strain measuring instrumentation.

SERVICES

Underground high pressure gas storage

COMMISSIONING of the most up-to-date gas storage plant in the U.K. is expected in November. Located on the edge of Biggin Hill airfield in Kent, it will have a storage capacity of 10m cubic feet at a pressure of the order of 1,000 p.s.i. When completed it will have cost over £1m.

From an environmental point of view the chief virtue of the system is that it eliminates the need for the ugly gas holders that have for so long been a dominating feature of both town and countryside. At Biggin Hill, the South Eastern Gas Board secured some 20 acres of farmland for its project and most of this will be restored and used once more for farming.

The storage system consists of about three miles of 42-inch diameter pipes laid underground. There are 17 lengths, each 1,040 feet long, laid with a slight fall of about 15 feet in each length in parallel lines and terminating in headers which either carry the gas to the pressure let-down units or bring in gas from the compression stage for storage.

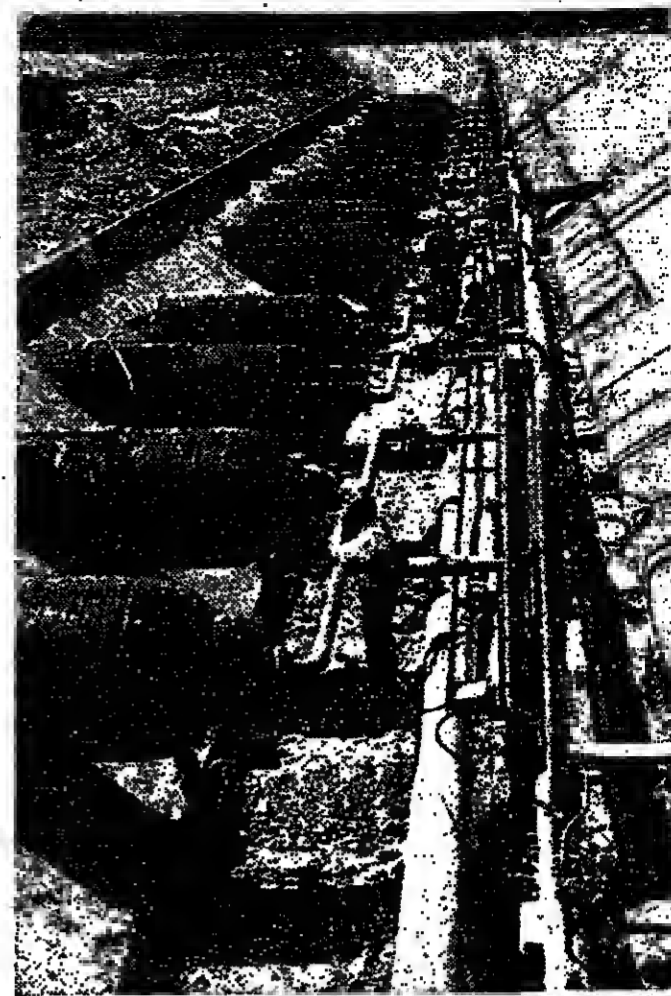
Town gas for storage will come from the 12-inch diameter outer London main operating at 100 to 180 p.s.i. about 2½ miles away, while a second source of supply, which will be used after conver-

sion to natural gas has been completed, will be the 18-inch diameter supergrid running from the Isle of Grain in north Kent to Haslemere in Surrey and about two miles away. This source will be used after conversion to natural gas.

Storage of gas will be from inlet pressures of 100 to 180 p.s.i. and this supply will be compressed to fill the storage pipes by means of large compressors driven by 2,000 h.p. Brush electric motors connected to an 11 kV power supply. Electricity will normally be used in the off-peak period and the annual bill for power will be about £40,000.

Only two men will be needed to run the system and operation of the whole plant will be controlled from a central console. However, the South Eastern Gas Board is already looking to the time when it will operate the plant from its central control room several miles away in Croydon. Mr. David Woodall, the Board's area controller, told the Financial Times: "If this system proves as successful as we believe it will be, then we shall go ahead with another installation."

The main contractor for the Biggin Hill project is Humphreys and Glasgow with Sir Robert McAlpine as sub-contractor. Work on the site began in July last year.



The ends of the storage pipes of the South Eastern Gas Board's underground system at Biggin Hill, Kent, project into a concrete-lined trench. As can be seen here, the pipe ends are closed by high-strength steel domes which connect with the main supply header and through which they are linked to the gas compressing and pressure let-down equipment. This trench will eventually be roofed over.

Gas laser aloft

OPTONICS branch of U.S. Air Force Avionics at Wright-Patterson Air Force Base, Dayton, Ohio, has given Honeywell a U.S. \$98,000 contract to develop a compact 100-watt carbon dioxide airborne laser.

To be built at Honeywell's Systems and Research Centre, Minneapolis, will operate on a single gas fill, eliminating need for bulky bottle or pumps normally used with a laser of that output power.

The 12-month contract calls for design, construction and test of the unit, which is expected to weigh less than 50 lbs. It is for possible use in high-performance aircraft for reconnaissance application in a new approach to active ground illumination.

Dr. Hans Mockler at Minneapolis has been a pioneer in development of sealed-off lasers. A ten-watt system he built holds an operational record of close to 10,000 hours with little loss of power. This is about three times previous systems.

Calibrating electrolyte

ELECTROLYTIC meters to measure current flows are common enough but they are inflexible—there has been no easy way to set them back to zero. Since they work on the principle of electroplating and a current removes metal from one electrode and transfers it across an electrolyte to build up another, the only way of going back to the original position was to reverse the polarity.

Temperature control

SOLID-STATE indicating temperature controllers from Eurotherm are self-contained for up to 25 Amp output through relays or thyristors. The units are of three-term control action type and have a variety of optional output modes to cater for virtually any industrial application that a designer could require. There is a dual-output model for

heat-cool control of plastics machines.

The scale is 400 mm and the controls are fascia mounted behind a lockable door. The instruments accept thermocouple inputs and thermocouple break protection and automatic cold junction compensation are fitted as standard.

From its Broadwater Trading Estate, Worthing, Sussex, has been expanding rapidly, not only in the U.K. but also into countries overseas. Subsidiaries have been set up in Germany and Switzerland, following the establishment last year of a bridgehead in the United States.

The company now is established in most European countries, Australasia, Japan and South Africa.

It will be in full production of the new range by September this year.

HANDLING

Speeds the mail orders

IN SPITE of recent depressed conditions in the industry, one of the highest mail order houses in Britain—Kay and Co.—has just completed a major expansion of its handling facilities to meet increasing pressure of business.

With a floor area of 1m. square feet to be erected, Bagshaw and Co., mechanical handling designers, were called in to advise at the earliest stage, as it was envisaged that the warehouse would be basically automatic in operation.

The main problem was to devise and install a system which would be able to cater for about 38,000 parcels a day—made up of possibly 100,000 items—to be despatched from the warehouse in response to customer orders. All the items are stocked in the warehouse, and any order received is to be despatched within 48 hours.

Goods, coded for identification, are stored in numbered racks on three floors of the six-level building; a Bagshaw ES overhead conveyor circulates around these three floors in turn, supporting carriers of special design at 2 feet 6 inches pitch, each carrier holding three order-picking trays

measuring 33 inches by 18 inches by 10 inches deep. Each carrier is numbered, and the three tray positions are coded A, B, and C.

The carrier, which always refers to the lower tray position of carrier No. 638. The carriers are coloured alternatively blue and yellow, providing a capability to operate at half strength if required by using only the yellow, odd numbered, carriers.

The carrier conveyor, which circulates in the order picking areas can move at any speed between 15 and 90 feet/minute, depending on the order requirements for the day; with a total circuit length of 1,500 feet, and at the present average speed of 35 feet/minute, one complete circuit takes 4½ minutes. With a total of 600 carriers on the conveyor, this provides the capability of handling 2,400 trays per hour at present, with a maximum rated throughput of 6,000 at top speed. All other conveyors in the system operate at fixed speeds.

The control system Bagshaw designed enables the warehouse manager to adjust the speed of the main conveyor each morning—or at any time during the day—to suit the workload for the day. Details of the orders received are fed into a computer which then issues instructions to the order pickers, giving full details of what items are required, which tray and carrier the items are to be inserted in, and on what circuit of the conveyor.

An optical system is now being installed which will show what circuit number is running at any time; thus many different items from one customer making up one order can all be inserted into the same tray during its circuit of the warehouse; at the end of the order picking area, a supervisor checks each tray to ensure that the contents match the order instructions.

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Compacting waste

WASTE materials generated by the smaller industrial complex, supermarkets, office blocks or flats, can be compacted into multi-bucket and roll-on compactors by a disposal unit which can handle over 125 cubic yards per hour. Using a ram pressure holding three order-picking trays

tons the unit will fill containers ranging from 11 to 30 cubic yards and weighing a maximum of 12 tons.

Manufactured by Anthonys Bell Lane, Amersham, Bucks, the units have so far been installed in the U.K.

AUTOMATION

Drawing at high speed

INTENDED for almost any job where computer output lends itself to graphic presentation, the model 482 drum drafting machine has been launched in Europe by The Gerber Scientific Instruments Company of South Windsor, Connecticut.

It is designed for high-speed accurate handling of such applications as verification of printer and integrated circuit board masters, numerical control tape verification, schematics, chart and graphs.

Gerber claims that the system is capable of drawing at speeds of over 2,000 inches per minute, and that its ability to accelerate to this speed in less than 30 milliseconds is the key to its performance.

The system consists of the new Gerber Series 400 magnetic tape control, tailored as an input device, and the model 62 drum system. Input to the control is through an IBM-compatible 800 bpi nine-track magnetic tape.

The series 400 control uses a Hewlett Packard series 20 computer with 4k core memory (word size 16 bits). The control console consists of a single bay in which the magnetic tape unit, the computer and the interface are mounted.

Velocity computations for optimum speed control are provided as part of the system's basic software package. The operational software also provides full linear interpolating routines, dashed lines generation, and automatic reversion upon detection of a lateral or longitudinal parity error.

The drawing head on the standard system is capable of 30 inches of travel in the Y direction with the two outside pens of a three pen assembly that can draw with liquid ink, ball point or felt tip. In unattended operation Gerber claims that the unit can continuously draw in lengths to 38 metres.

PROCESSING

Filtering the unfilterable

BECAUSE a filtration plant clogged too rapidly to function properly the maker experimented with it and discovered a different method of operation which extended its use to solid/liquid separation problems previously considered insoluble.

Briefly, the plant consists of a stainless steel mesh drum (with solid ends) on the outside of which is stretched a nylon monofilament filtration medium, capable of filtering particles of 30 microns.

The drum revolves inside a tank. The slurry flows in at 15 psi at the base of the tank and the filtrate is removed from inside the drum via the bnh. Halfway up the drum on the intake side is a cleaning nozzle which removes the solids collected on the filter by entraining them in a small proportion of the slurry.

During use the filter medium is cleaned either intermittently or continuously—it is stated that the whole drum can be progressively cleaned and brought back into use in 4 seconds.

In one particular application for the filtration of fine particles from a water soluble oil solution (machine tool coolant) it was found when operating the filter on an intermittent cleaning basis that the filter medium became heavily coated (or "plugged") in less than 8 seconds, and even on continuous

operation the slurry blocked the filter in 20 seconds.

The maker experimented with increasing the drum revolution speed from the standard 2 rpm to 54 rpm, and found the problem was solved—until the customer increased the flow through the filter from 200 gallons/minute to 300 gallons/minute with an increase in the volume of contamination in the liquid.

The maker again increased the drum speed and at 15 rpm the plant was operating successfully.

Mr. R. F. Worledge, managing director of the filtration plant maker, Euroflow Systems, Strand

Street, Poole, Dorset, told the Financial Times: "We do not yet know how much it will be possible to further increase the speed of the drum and so tackle even more difficult problems, but from results in the field and laboratory experiments we are now able to tackle the filtration of sludges previously regarded as unfilterable."

Euroflow has fitted the filter with a variable speed drive from the drum, controlled by pressure variations within the filter, so that drum speed is automatically adjusted to provide the correct cleaning rate.

ANNUAL STATEMENTS GRAIGIELEA RUBBER PLANTATIONS LTD.

The Annual General Meeting of Graigielea Rubber Plantations Limited will be held on September 16 in London.

The following are extracts from the annual review of the Chairman, MR. A. W. SCOTT:

Rubber prices showed a marked downward trend during the year under review and notwithstanding the very satisfactory premiums which were obtained for our pale crepe, the profits earned from the company's rubber areas were halved.

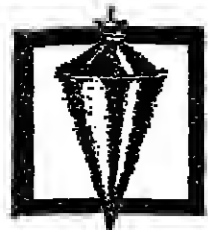
In contrast the price of palm oil moved upwards. The company's output is still relatively small but even so oil palms contributed £48,000, equivalent to 24% of the gross profit for the year as against £2,000 in 1969/70.

As a result of the disposal of Johore River Estate, the future boost to our investment income from the Straits Rubber Company shares which were acquired in exchange and the promise made when the carry forward was increased last year.

So far as rubber is concerned it is too early to assess the prospects for the current year but prospects for the oil palm side of our business are good. Income from our investments in rubber companies should be not less than £55,000 this year, the elimination of a sizeable dividend of 71%.

This advertisement is issued to Truman ordinary shareholders by Guinness Mahon & Co. Limited on behalf of Watney Mann Limited. The duly authorised Committee of the Board of Watney Mann Limited has considered all statements of fact and opinion contained herein and accepts individually and collectively responsibility therefor.

هكذا من الأصل



Building and Civil Engineering

Bovis in Canadian dredging scheme

OCEAN vessels up to 100,000 tons will be able to reach Quebec City Harbour when the \$3.7m. contract for the deepening and widening of a channel through the St. Lawrence Seaway is completed.

A joint venture of three companies—Bovis Corporation (the Bovis Group's Canadian subsidiary), Marine Industries and J. P. Porter, both of Montreal—has been awarded the contract for upgrading an 18-mile channel through the Seaway north of the island of Orleans into Quebec City.

Passage up the Seaway is now limited to vessels of 45,000 tons or less. In clearing the channel to a depth of 48 feet from its current depth of 35 feet and widening it at various points from 550 to 1,400 feet, more than 14m. cubic yards of material will have to be dredged.

Two of the world's largest suction dredgers, using 36-inch and 30-inch cutter heads, will be used. Three self-powered hopper scows are to be built in Canada for the project at a cost of around C\$1m. each.

Manchester development

FIRST phase of the Market Place, Central Manchester, redevelopment for CWT (Developments)—a subsidiary of Central and District Properties—is to be undertaken by C. Bryant and Son.

The £2.5m. development covers a five-acre site which includes an extensive frontage on to the north side of Market Street from Marks and Spencer's existing store across Deansgate to the River Irwell and northwards to Gate Street.

Besides 33 shops, the development comprises two stores as

well as a 68,000 square feet extension to Marks and Spencer's store. 282,000 square feet of office accommodation is to be provided in four tower blocks and underground parking space for over 700 cars.

Of in situ reinforced concrete construction, the buildings will be faced with exposed white limestone aggregate with aluminium windows.

The focal point of the scheme will be a pedestrian square in which two buildings of historic interest, the Old Wellington Inn and Sinclair's Oyster Bar, have been retained. These buildings were recently raised almost 5 feet by means of hydraulic jacks from their old foundations.

This aspect of the work was carried out as a preliminary to the main contract by Pynfords

(Midlands). The lifting took place in 4-inch stages and in order to calculate the correct pressures, the weights of the buildings were estimated at 147 tons and 701 tons respectively.

Architects for the overall scheme are Cruickshank and Seward and the consulting engineers are Ove Arup and Partners.

Rotherham steelworks extension

CIVIL engineering works associated with the extension to the existing primary mill building at the Rotherham Works of the British Steel Corporation's Special Steels Division, are being carried out by Henry Boot Construction.

The BSC estimates the value of the overall project to be in the region of £1.4m. of which Boot's share is worth £366,000.

Purpose of the scheme is to provide accommodation for new equipment used in the production of high-grade billets. The extended primary mill building will form a billet finishing bay in which part of the billet inspection, dressing and handling equipment will also be installed.

The remainder of the equipment will be installed in a new 300 by 90 foot building. Designed by Tollerfield and Partners, of Doncaster, the project should take 72 weeks to finish.

Scunthorpe steelworks water plant

WATER treatment plant is to be installed by Degremont Laing for the Anchor project of the British Steel Corporation at Scunthorpe. Lines. Rated at 21,600 gallons/minute, the £1.1m. plant will supply water to the bloom, hot metal and medium section mills, scheduled to be commissioned towards the end of next year. Degremont Laing is responsible for the design and construction of the complete plant, including civil engineering, and work is due to start on site in October. The plant comprises clarification and filtration equipment, enabling water to be recycled

after use. It includes four clarifiers with scrapers, 12 steel pressure filters and three cooling towers with associated pipework and plant houses. Consulting engineers for this section of the Anchor project are McLellan and Partners, and Metz and McLellan.

Home fires burn to more purpose

WITH WINTER not so far away and many methods of improving the level of comfort in dwellings being promoted in the press, a report just issued by the Agreement Board in its Paper No. 8 compares methods and materials used to fill the voids in cavity brickwork.

Only two different products are examined—water-proofed mineral wool and foamed urethane formaldehyde resin—on the grounds that other materials such as water-repellent glass fibre, polystyrene foam and polystyrene pellets are not in full-scale use "so far as is known."

The water-proofed mineral wool process and the installation of this material is covered by an independent technical approval certificate from the Board. The other material and its process also have been granted a certificate. In both instances, the award applies to one company only.

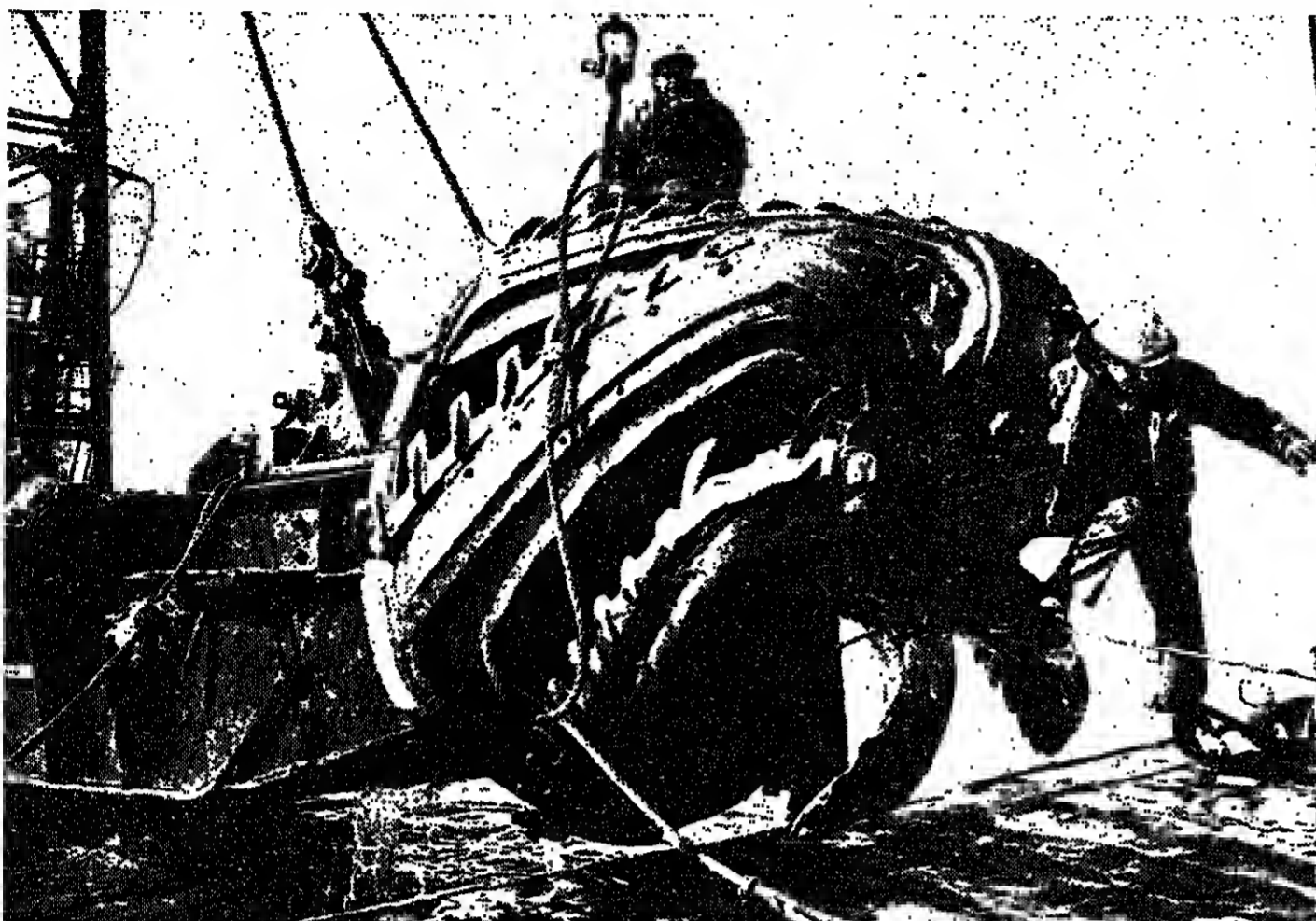
No doubt exists that, provided the materials are properly applied, the heat loss insulation provided by their use is very worthwhile. A mean "U" value for the two fills is taken as 0.25 BTU per square foot per hour and degree F. The figure for treated cavity walls drops to 0.1 unit compared with 0.3 for untreated structures and 0.43 for plastered 9-inch solid brickwork. These figures show a considerable gain over what is possible with other commonly-used

methods of improving insulation such as by substituting lightweight blocks for the inner leaf or by using one or other type of wallboard applied to battens on the inner wall.

When drawing this conclusion from its research, the report makes the point that cavity fill achieves the indicated results at far less cost than the addition of plasterboard. It can be generally estimated as around three to five times cheaper.

An important observation is that the effects on fuel economy must depend on the total construction and especially the proportion of window to wall, insulation in the roof space and so on. The advantages moreover, shows up best in continuously-heated buildings because in the case of cheap housing there is some advantage to be gained in intermittent heating conditions when boards on battens are used as the internal insulation.

One point the report draws attention to is the need to achieve a relatively dense foam free from gross cracking which could penetrate through the foam thickness and cause trouble with moisture penetration. Mechanical strength of the foam was not thought to be relevant to structural strength of the wall but certainly to the need to avoid a collapse under its own weight. Although only situations up to two storeys had been examined, there was no evidence of risk of failure from this cause.



One of the two suction dredgers which will be used on the St. Lawrence Seaway widening and deepening project. This vessel is owned by Bovis Corporation, one of the three contractors. The picture shows the dredger's cutting head.

£2m. first stage of Oldbury job

A joint venture of Bryant Holdings and Sannell Properties has been selected to carry out the central area redevelopment of Oldbury.

A full planning application is to be lodged next month for the 23-acre project, the first stage of which is reckoned to cost around £2m. About six acres of land are scheduled for private residential development, and it is the developers' intention to produce an interesting layout of low-cost small homes in a landscaped area.

The shopping centre will consist of a Woolco store for F. W. Woolworth and Co., a department store, a supermarket, 26 shop units, an entertainment centre, two floors of office space, 12 townhouse maisonettes, a public house and a service garage.

Parking for around 1,200 cars is to be provided at ground level. Future stages are planned to include a new library as well as new offices for County Borough of Warrley departments. The scheme has been designed by James A. Roberts, of Birmingham, and it is hoped that a start

may be made early in 1973. An exhibition of the scheme is on display in the municipal buildings, Oldbury, until Saturday, August 28.

Bletchley housing

THREE projects together valued at around £1m. have recently been started by Bernard Sunley and Sons. At Bletchley, the company is to complete the erection of 66 flats and garages, 10 shops and a supermarket, public houses and ancillary works on the Water Eaton Estate for the Greater London Council.

This scheme, forming part of the Bletchley Central Area Development, was started by another contractor which subsequently went into liquidation. The value of the outstanding work is £540,000.

The other contracts are for an eight-storey office block at Gosforth and a single-storey warehouse at Watford.

Plastics in building

AN international symposium on the subject "Plastics in Building To-morrow" is being arranged for April 12, 1972, by the Effa Plastics Association in conjunction with the Danish Plastics Federation.

The subjects to be covered include: Living Conditions of the 80's; Engineering Design in Plastics; and Future Possibilities for the use of Plastics in Building. Prospective speakers should send detailed synopses of papers for consideration by a selection committee before the end of October.

Synopses should be sent to the Secretariat: Mr. H. G. Bowyer, the Effa Plastics Association, c/o British Plastics Federation, 47, Piccadilly, London W1V 0DN.

Australian contracts for Costain

LARGEST of the jobs totalling \$3m. recently gained by Costain (Australia) Pty., of Melbourne, concerns the construction of a three-storey abutting complex at Beach Street, Frankston, Victoria, for the National Mutual Life Association of Australia.

The £1.7m. project, designed by McIntyre McIntyre and Partners Pty., involves the use of a reinforced concrete frame and floors with metal deck roofing on light steel trusses. Structural engineers are John Connell and Associates.

At Queen's Road, Melbourne, Costain is to build a 12-storey office block for Guardian Assurance Company under a £1.1m. order. The basement raft and retaining wall were previously constructed by the company under a separate contract.

The company is also to add two floors to the architectural building at the University of New South Wales, Sydney, under a £126,000 order. In addition, site clearance, basement excavation and pile foundations are to be undertaken for a further office block in Melbourne being developed by Centrovine Estates Pty.

Terminal and car parks

AT Southampton Docks a freight terminal is to be built for Freightliners by Kyle Stewart (Contractors) under a £600,000 contract.

Work includes the construction of crane foundations, the laying of permanent way, roads, drainage and paved areas, and is due to be finished by the end of the year.

A start has been made on the construction of an £830,000 container terminal at Ripple Lane, Barking, Essex, for Container Base (Barking). Included are a steel-framed asbestos-clad transit shed measuring 163 by 47 metres; an amenities building of 80 by 15 metres to be of block and brick construction, and a vehicle repair shop measuring 40 by 20 metres.

Under a £400,000 contract from the Southern Region of British Rail, 30 car parks are to be created at stations in Kent, Sussex, Surrey and Hampshire. The jobs include levelling, drainage, fencing and surfacing.

A further order, valued at £200,000, has been negotiated for the construction of a commuter car park on the site of the old locomotive works at Brighton. It will be reached by a prestressed concrete bridge from Cheapside and the job includes a bridge, roads, retaining walls and drainage. Space will be provided for 900 cars and work should be finished by early next year.

Filters out the fumes

WITH no increase in size and no reduction in its original efficiency, a new air-conditioning system has been adapted to prevent the smell of diesel fumes creating unpleasant working conditions for personnel in a major car plant.

Thirty CF-4 activated-carbon filter units made and supplied by GKN Filtration have been installed in the air-conditioning system of a three-storey office building at the Rover Company, Solihull, to prevent the smell of diesel oil reaching the offices. Since the carbon filters were installed, not only has offence not occurred, but other objectionable odours have been reduced.

The three-year-old office building, housing engineering staff concerned with vehicle design and production, is double glazed with no opening windows, and is designed to provide a congenial and healthy working atmosphere at all times. All heating, ventilating and humidity requirements are monitored and supplied as necessary by sophisticated 60,000 cubic feet/minute air-conditioning system.

From the time the building was first occupied, reports were received periodically of an occasional "diesel" type odour inside the building. The air-conditioning system itself was checked and it was established that this was not the source. Diesel engines associated with heat exchangers located some distance from the offices were eventually blamed—until the odour occurred on a day when all these diesels were shut down. It was finally discovered that the source

was the idling engines of diesel-powered lorries waiting to enter a nearby loading bay.

Sinking a mine shaft

AT Cobarr in New South Wales, Cementation Company (Australia) in joint venture with Thless Bros. Pty. has been awarded a \$3m. contract for the sinking of a 20 feet diameter shaft to a depth of 3,300 feet.

The development is for Cobarr Mines Pty. (a subsidiary of Broken Hill Smith) and the works include construction of the shaft collar, temporary headframe, together with the excavation, concrete lining and equipping of the new shaft.

The No. 3 shaft has been located near the Chesney ore body which has previously been outlined by diamond drilling and will provide access for exploration and development on the 3,000 feet horizon for extensions and/or repetitions of orebodies beneath old workings south of the town of Cobarr.

Preliminary works are scheduled to commence later this year, and shaft sinking during early 1973 for completion by March, 1974.

The Cementation-Thless joint venture is currently sinking two major shafts, 3,300 feet and 4,000 feet deep respectively, for Mount Isa Mines at Mount Isa in Queensland.

Cementation-Thless' contract

More room in Parliament

ADDITIONAL accommodation at the Houses of Parliament is being created under two contracts together valued at £385,000 recently started by Holland Hannen & Cubitts (Southern).

The larger of the jobs concerns the provision of extra space over the lawers room in the House of Commons. A three-storey steel-framed clipsham stone-faced extension is to be built.

To make way for the new structure, the roof of the existing building is to be removed, but an ornamental ceiling is to

be being administered by Cobarr Mines Pty. and the consulting engineers are Harcastle and Richards.

Glass bars traffic noise

RECOMMENDING 12 mm (½ in) thick float glass, single glazed or in a conventional double glazing unit, as an effective barrier against noise, Pilkington's environmental advisory service says independent tests show that the sound insulation performance of 12 mm glass is effective, particularly in the low frequencies, 200 to 500 hertz, where such noise predominates.

In a 50 per cent. glazed facade of brick, concrete or similar material, the average sound insulation for 12 mm glass is 32dB single glazed. It is 38dB with the conventional 6 mm air-space double glazed unit using one pane of thick glass. In a 100 per cent. glazed facade, the figures are 29dB and 32dB respectively.

By subtracting acceptable interior noise levels from the external traffic noise levels, the degree of sound insulation required can quickly be estimated. The traffic noise levels accepted are based on Building Research Station Digest No. 38 figures and are to be incorporated later this year in British Standard CP 153, Pt 3, "Sound Insulation."

he protected and preserved. Roof demolition and construction of a new floor should be completed during the summer recess of Parliament.

The other project, worth £150,000, involves extensions to the Law Lords' accommodation in the House of Lords. This building will also be a three-storey steel-framed structure to be faced with clipsham stone.

Work on both schemes will be carried out while the Houses are not sitting and completion is scheduled for next August.

In Brief

● GEORGE Wimpey and Co. has been awarded a £74,000 contract by the Borough of Swindon for the construction of roads and sewers at South Dorean, Swindon, where a housing development is to be built.

● FOR the Ministry of Defence, G. T. Crouch is to build 138 houses in Plymouth under a £720,000 order. Of traditional load-bearing brick construction, the houses will be semi-detached and terraced. This contract brings Crouch's work for the Ministry in Plymouth to £2.2m. since 1967.

● PHASE two of the Mordishaw storm water trunk sewer is to be laid by Norwest Construction (Civil Engineering) for Runcorn

Development Corporation. Valued at £16,000, the contract involves the laying of 750 metres of pipe sewers, 300 metres of smooth bore segment-lined tunnel, 100 metres of bolted segmental tunnel with concrete lining, manholes, cast-iron and reinforced concrete culvert outfall to the existing watercourse.

● LEHANE Mackenzie and Shand has been awarded a £300,000 order to build a store for Tesco Stores at Derby Street, Macclesfield, Cheshire. The building will have two main floors with a mezzanine floor to provide a total area of 4,100 square metres. Completion is due next August, and the scheme has been designed by Inskip and Wylczyński, architects of London.

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There's a big move towards Redland Fibaflo—the GRP pipe that copes with aggressive effluents peacefully

The new Redland Fibaflo GRP pipe is, strength for strength, a quarter the weight of steel. And it lasts longer, because its resin formulation can be modified to resist most chemicals and aggressive effluents.

It can be engineered to fine tolerances in strength and performance. Fibaflo is already being specified for tunnel linings and chemical plants, but there are applications we haven't even thought of yet. You may have a problem we can solve together. Write for the Redland Fibaflo manual FT/RP21.

Redland Pipes Ltd., GRP Division, Parkstone, Poole, Dorset BH14 9BJ. Telephone: Bournemouth 61226. Telex: 41175

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MONDAY AUGUST 23 1971

The danger to world trade

WHEN FOREIGN exchange markets open this morning the pound will be floating. There can be no question but that the British Government has taken the right decision. An attempt to hold the old rate would have been defeated by market forces. To go to a new fixed rate in present circumstances would have been sheer madness. As it is the authorities have given themselves much needed flexibility not only in what is bound to be an uncertain short-term future in markets but also, if they play their cards right, against the day of Britain's entry into the EEC. This result, moreover, has been achieved without giving offence to any of our future partners in the EEC—themselves deeply divided—to the Americans or to other countries.

The beginning

So far then the U.K. has come as well as it could hope to out of a confusing and highly dangerous situation. But we are of course only at the beginning of a major upheaval of the world monetary system which could all too easily undermine the trading rules under which the world has prospered since the end of the war. Now that the Americans have imposed the import surcharge it can be used by them as a multi-purpose weapon. They may well try to make its removal dependent not merely on a currency realignment which leaves the dollar realistically valued but also on fairer "burden-sharing" in defence or the removal of non-tariff trade barriers which they have long complained about.

It is perfectly right and proper that the rest of the world should point out to the Americans that the surcharge is contrary to GATT rules and that at the least a time limit should be set. But there should be no illusions that, with Washington in its present mood and subject to the political pressures of high unemployment, the administration is likely to cave in easily to foreign demands for removal of the surcharge. In this situation two considerations should guide policy, the first tactical, the second more fundamental.

The fruits of internment

IT IS NOW two weeks since the policy of internment was instituted in Northern Ireland and, while the situation is still confused, quite enough has occurred to allow a provisional balance to be cast. To begin with the success side of the ledger, it may be said that internment has certainly had one of the results expected of it—it has calmed a dangerously restive Protestant majority and enabled Mr. Brian Faulkner to reassert his control over the Unionist Party's actions. However, this control will not be regarded as an open question, seeing that a number of powerful enemies to his right are still busily undermining his position. But at least Mr. Faulkner has gained a short breathing space.

Disappointing

The security dividends from internment have not been entirely non-existent, but they have been disappointing. Some dangerous individuals are certainly under lock and key and the IRA are protesting rather too much to be entirely credible when they claim that their command structure is intact. On the other hand the imminence of the operation was widely suspected before it took place and considerable numbers have undoubtedly slipped through the net. It may be true that neither branch of the IRA, by itself and without the active assistance of the Catholic population, could now last long in an open confrontation with Army in the streets; but it does not look as if the underlying situation is much better than it was during the period of explosions and shootings which preceded internment.

However, by far the gravest consequence of the arrests has been their effect on the Catholic population. This has far exceeded both in scope and depth anything that the authorities could have planned. Before internment it was said that only a small minority of Catholics were in serious conflict with a man in the Army. After internment it has to be faced that a considerable section of the help.

Few options

The British Government is thus left with very few options. Even if the security situation improves, it is no longer possible to rule Ulster for more than a brief period without some element of co-operation from the Catholic community and therefore new political initiatives must be forthcoming as soon as the present frenzy has subsided. But if these initiatives were to be of a kind calculated to satisfy the Catholics in their present frame of mind they could only be imposed on the Protestants by direct rule from Westminster. And since Mr. Heath and Mr. Mulholland are understandably anxious to avoid direct rule they must perforce try to placate the Catholics by such lesser means as they can.

What those means might be is terribly hard to say, but two things stand out very clearly. The first is that if the internment system is to be retained it must at least be refined and made less open to propaganda exploitation by the IRA. The second is that the co-operation of the Dublin Government will be invaluable, if not indispensable, in the coming months. Mr. Lynch is in a difficult political position and his telegram to Mr. Heath last week was to say the least tactless. But Mr. Heath would be unwise to fall out at this stage with a man who is certainly able within limits, and possibly willing, to

THE BARRICADES are now well and truly up between the Dublin and Belfast Governments, following the bitter war of words between their respective Prime Ministers, Mr. Jack Lynch and Mr. Brian Faulkner; but the confrontation conceals the fact that the two parts of Ireland—and the two leaders—still share a great deal of common ground in both commercial and political affairs.

It is much too early to say just how the present crisis will affect cross-border economic co-operation, but the signs can hardly be very encouraging, following Mr. Faulkner's assertion that "no further attempt by us to deal constructively with the present Dublin Government is possible." This, presumably, means that at best the developing economic rapprochement between the Irish Republic and Northern Ireland is to be halted; at worst, it means a definite reversal, and this could lead to even fewer jobs on each side of the partition line—and possibly to additional expenditure in both areas merely to run existing State services.

The 'economic border'

Even before the tragic events of the past two weeks, it was difficult to find much common ground between Dublin, Belfast and London on the "Irish question." Yet all three Governments, both publicly and in private discussions, supported the notion of closer economic ties between North and South. This agreement stemmed partly from mutual self-interest, but mainly—in recent times—from a recognition that the "economic border" will have to go in any event in the context of Common Market membership. This is still a hard reality, although it is difficult to get people to appreciate it after so much violence and death in the North.

Shortly before the present crisis erupted, there had been a great deal of interesting, if seldom widely publicised, moves to improve cross-border economic relations. Some senior officials of the Belfast and Dublin Governments met here in April to discuss trade and allied matters, and it was envisaged on both sides that a further meeting in Belfast at official level would be followed by talks between Ministers later this year.

A sub-committee of the Northern Ireland Economic Council visited the South and talked with a number of State agencies, including the Irish Sugar Company and the Export Board, and the Confederation of Irish Industry here called on the two Governments to develop detailed plans for submission in due course to the European Community in the field of

regional projects spanning the frontier.

Industrialists on both sides of the border have long been firm advocates of greatly increased economic co-operation between the two parts of Ireland, but many of them have been inhibited for political reasons. Equally, officials of the two Governments concerned with industrial development are very conscious of the fact that in border areas (such as Donegal-Derry and the Cavan-Fermanagh regions), where industrialisation is hampered by national boundaries. But they, too, appreciate the political sensitivities involved.

Both sides, then, have been looking to the EEC, the argument being that the initiative—and, hopefully, much of the necessary finance—would be seen to come from European institutions and thus represent no political "concession" by either of the Governments. Meanwhile, of course, ordinary trade has continued across the border. Indeed, it increased by more than 150 per cent. between 1962 and last year, from £34m. to £87m.—partly through the stimulus provided in the 1965 Anglo-Irish free trade area agreement, under which the Irish side is reducing tariffs by 10 per cent. each year on most imports from the U.K.,

including Northern Ireland. By coincidence or design, trade between the two parts of Ireland, as a percentage of the total trade of each, is now an identical 8 per cent.; but this conceals a very favourable balance enjoyed by the Irish Republic, practically a unique situation for a country which has an endemic deficit in its external merchandise trade (over £222m. in 1970).

A political decision

Mr. Faulkner has pointed to this imbalance in North-South trade as proof that Dublin is getting the better bargain, particularly since goods from the Republic enter Northern Ireland free of duty, whereas traffic in the opposite direction is still subject to tariffs, albeit at a declining level. He also pointed to the fact, in an interview with the Financial Times prior to the latest outbreak of violence, that Mr. Lynch's Government was now using an escape clause in the Anglo-Irish trade agreement to modify tariff reductions on some imports and affect a standstill on other tariffs, end that both of these steps would hit exports from the North.

The Dublin Government had, I understand, been considering offering preferential tariff cuts

to Ulster but Northern Ministers felt that this was something they would have to request specifically, and that that would amount to a political decision.

Further, there is a feeling at Stormont that Northern Ireland should not ask for concessions within the Anglo-Irish trade pact which do not apply to Britain generally, since to do so would tend, even indirectly, to undermine the Belfast assertion that the province is an integral part of the U.K.

In fact, this type of political consideration has all too frequently got in the way of economic links between North and South. Dublin, too, has been at fault in appearing to barter trade terms for political concessions. Since practically all imports from Northern Ireland come here duty free, it would have been a useful gesture—and not very expensive in terms of "lost" revenue—if Mr. Lynch had offered to abolish all remaining tariffs against goods from Ulster. At the present level of tariffs, the direct loss would be a mere £600,000 annually.

Much larger sums are certainly involved in other areas of North-South co-operation, such as this year's agreement to connect the two-power transmission systems. (IRA gunmen would be more than anxious to bomb

these links.) This allows both electricity authorities to budget for a much smaller margin of spare capacity, resulting in an estimated saving of some £10m. in capital investment between the two Governments.

This agreement, incidentally, led to hopes that the two sides might be prepared to co-operate on nuclear power stations, but this has not proved possible, and the electricity supply board here, subject to Government approval, now intends to press on with its own nuclear programme.

Admittedly, some Government sources insist that "Faulkner is finished," but the Northern Premier is an experienced, astute and able politician, and many political observers in Dublin and Belfast are convinced that if the Unionist Party can be persuaded to buy a new political deal for Ulster, Mr. Faulkner is just the right kind of salesman.

Dublin's immediate emphasis now is clearly to bring about a new order of administration in the North in which the Roman Catholic minority there has an influence roughly proportionate to its actual numerical strength. This, if it finally comes about, may well mean a much different Stormont than at present, but it does not necessarily mean the end of Mr. Faulkner.

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Tourism hard hit

There are many more areas of contact further down the scale, including (but not generally disclosed) a degree of liaison between the defence forces on both sides of the border. Army personnel here are formalised arrangements between Dublin, Belfast and London for an exchange of information in wartime on such areas as nuclear explosions and radioactive fallout.

These and other areas of North-South contact—not least tourism, where both parts of Ireland have suffered badly as a result of the international

IRELAND: THE ECONOMIC TIES BETWEEN NORTH AND SOUTH

What Dublin and Belfast still have in common

Despite the crisis in North-South relations, the two parts of Ireland, and the two leaders, still share a great deal of common ground, both in economic and political affairs. Dominick J. Coyle, in Dublin, examines the strength of these ties



Mr. Jack Lynch (left), the Eire Premier, and Mr. Brian Faulkner, Prime Minister of Ulster: in an odd sort of way they may even be said to complement one another.



spotlight turned on the Ulster troubles—are much too valuable to the respective Governments to be allowed to disappear in a sea of bitter words or personal pique. Indeed, they could now usefully be institutionalised in a formal all-Ireland economic council, as suggested by Premier Lynch, without in any way implying political (or constitutional) concessions on either side.

Northern Ireland and the Irish Republic share a vested interest in creating more industrial jobs: in a small island of mere 43m. people, combined endeavours are more likely to exceed the sum total of individual efforts, and a few community barriers might very well be broken down in the process.

Hardliners in the wings

On a much more personal basis, Mr. Faulkner and Mr. Lynch may also have much in common in the immediate future, despite the bitterness of their recent verbal exchanges. They each have hardliners in their wings end, in an odd sort of way, they may even be said to complement one another.

If Mr. Lynch is finally brought down by dissidents in his own party, any replacement Fionna Fail Prime Minister is likely to take an even tougher line towards Stormont and a more sympathetic approach to the militant Republicans. That can hardly be in Mr. Faulkner's interests, since it would inevitably push the Unionist Party further to the right.

Lynch remains essentially a moderate man. He has already relegated to the sidelines the traditional Fionna Fail objective of securing a reunited Ireland. This could cost the party under his leadership votes at the next general election if one of his former Ministers, Mr. Kevin Boland, finally manages to get his new republican party off the ground, but it does represent something of a "concession" to Northern Ireland.

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MEN AND MATTERS

Taking it in spoonfuls

THE battle between man and machine should, in various terms, soon be settled at King's College, Cambridge. The affair began innocently enough, with Pyc-Unicam releasing news of a machine it markets called a Philips Liquid Scintillation Analyser. The news was that Prof. Franco Mecca, technical consultant for the Italian Vinegars (that includes wine) Control Board and a member of the EEC's Technical and Control Committee, has started using the analyser to detect moonshine wines, made from bananas, dates and even less mentionable substances. The machine does this by measuring the amount and type of radioactive carbon in the wines. The decomposition rate of the carbon in natural wines is quite different from that of wines which have been adulterated with ethyl alcohol and acetic acid.

So far, so good. But to say, as Pyc-Unicam has, that the analyser can date, to within a few weeks, the bottling of any post-war wine, or that, linked to another instrument, a gas chromatograph, it can also analyse, down to the last molecule, the contents of each bottle and so offer a value judgment is to ask for trouble from some who take pride in their palates. A challenge has come from Mr. Ken Christie, who does not fancy a mere machine usurping his position as buyer for Grants of St. James's and a Master of Wine. Grants will also have the services of the winner of its wine-tasting competition, Mr. Bryan Gale, a Hampshire garage owner and ex-Merchant Seaman, who says the trouble with the machine will prove to be that it "can't smack its lips."

Another wine shipper, Mr. Peter Hallgarten will also compete, doubting the analyser's ability to take into account "that the amount of radioactive heavy carbon varies considerably from one area to another, say from the Rhine Valley to the Moselle Valley," or that it understands the effects of capitalisation (the adding of sugar).

Ground rules for the competition will be decided this week. A professor from King's College is lending an analyser, normally used for dating archaeological specimens, to be adapted to take spoonfuls of wine. But I doubt if the dons will let the wretched thing get its cogs around any vintages from their notable cellar.

Irish salesmanship Part One

There have been better moments to launch campaigns for things Irish. But a six-figure sum is being spent next month to implant the message that "Great (Irish) grass grows great beef" in the minds of home counties' housewives. The problem, as the Irish Livestock and Meat Commission sees it, is that although one in five steaks or roasting joints bought in Britain come from the Republic, it is generally sold as "home-killed," English or even Scotch beef. It is partly a heritage of days when Irish beef was not as steady in quality or supply as it should have been.

The man out to change all this is Mr. Peter Needham, who was a top chemist before turning businessman and taking a marketing course at Harvard. He worked in Germany for the Irish Export Board and was marketing director for Irish Distillers before being made

general manager of the Live-stock and Meat Commission. In persuading the British that Irish beef is best, he says he is confident the housewife realises that "the cost of meat is closely related to the quality."

That might sound unlikely, but in Dublin they already credit him with one unusual marketing success, the introduction of Irish Coffee to West Germany.

Part Two From the safe distance of Chicago, here is a view of Belfast which takes the biscuit among callous public relations hand-outs. "In spite of burnings and street battles it's business as usual in Belfast for insurance representative Danny McNaughton. McNaughton sells personal accident income protection insurance policies for Combined Insurance Company of America by cold canvass down the streets in Belfast's business districts. During the week of August 9, at the height of the street battles, McNaughton sold 208 new policies, or one every 12 minutes of his working week.

"His achievement was applauded at a special shareholders' meeting of Combined, when a 20 per cent. share distribution was approved, effective September 24."

the property bond. Through all this he has been writing poetry. His new volume, *The City Round*, stems from the day when, for Punch, he meditated on Romance in Companies House.

I came on her by hazard, Ensured was I by fate, Her eyes were liquid assets, Her body, corporate. Stripped of reserves she stood there, Youthful, and sweet and shy, Her dividends half-covered, Her margins all awry! Extraordinary meeting! We were as birds set free—"Tell me your name," I whispered.

"Agenda," murmured she. I showered her hands with kisses— She obviously guessed How cumulative my ardour, How gross my interest. Her equity I bonoured, Her profits undisclosed, With special resolution I formally proposed. Ah Bliss! She coyly yielded— We'll marry in the Spring, And Heaven to bless our merger Subsidiaries shall bring.

Kinsman's next ambition is to write lyrics for pop songs.

And it's raining here

As our Sydney man was hearing over the telephone the decision to float the pound, there was an eclipse of the sun. This was accompanied, he reports, by thunder, an electrical storm and hailstones so big that they covered the slopes of a nearby park and a man was seen skiing down them for an hour. "Such was the verdict of the Australian Code on Perfidious Albion," he cables.

Observer

INTERNATIONAL STORES

GROUP RESULTS FOR THE YEAR ENDED 1st MAY 1971

	1971	1970
Sales	112,182,000	108,632,000
Trading profit	4,532,000	4,493,000
Profit before taxation	2,782,000	2,807,000
Taxation	1,071,000	1,178,000
Profit after taxation	1,711,000	1,629,000
Dividends (gross)—		
Preference	28,000	28,000
Ordinary—Interim paid 2.5%	232,000	232,000
Final proposed 9.0%	837,000	837,000
Profit retained	614,000	632,000
	1,711,000	1,629,000

Metals in Industry

Financial Times Survey

Expected revival slow to materialise

JOHN EDWARDS

The past year or so has been a happy time for virtually all sections of the non-ferrous metals industry. The effects of the longer-than-expected recession in the U.S. economy spread throughout the world from Japan to Europe, even to Australia, bringing a general decline in industrial activity and reduced demand for virtually every non-ferrous metal. After the boom years of 1968 and 1969, when demand for metals soared, prices were short, and there should be a period of depression. But the downturn lasted longer than anticipated, with no signs yet of the end for revival materialising. The metals industry has had to continue operating in depressed conditions. The result is that most metals now in too plentiful supply, and new production planned for the future is too plentiful. The market is too soft to go to. Perhaps the best example is tin. Over the years the industry has become used to an average growth rate of 8 per cent a year, which means an increasingly large rise in production capacity has to be created to keep pace with demand and as the total size of the market grows.

showed a slight decline in the U.S., the biggest single market and heart of the world's aluminium industry. However, producers consoled themselves with forecasts that the average would soon be restored by the expected revival in industrial activity in the U.S. this year. Now it is apparent that this revival in demand has not happened and indeed is unlikely to happen for some months yet, and producers have been forced to cut back production savagely to avoid building up unwieldy stocks.

Large discounts

In these circumstances price levels, fixed by the producers, have not held firm either. It is openly admitted that large discounts on the published quotation are being given by aluminium producers all over the world, including Britain. Where for example the London free market for aluminium is currently around £170 a ton, against the official producer price of £257.3 a ton. For producers this means accepting a lower return at a time when costs are rising sharply and being pushed up still higher by the reductions in output which cancel the benefits of being able to operate at near 100 per cent capacity.

The same pattern of events, with variations, has also hit most of the other major metals. Nickel, which was in such short supply only two years ago, is now suffering from such an

abundance that International Nickel, the world's biggest producer, recently decided to cut its output by 7 per cent. Tin prices have sunk near to the "floor" price of £1,350 a ton set under the International Tin Agreement. Lead prices in London have also had to be boosted by support buying by producers, and the threat of anti-pollution moves forcing the removal or reduction of lead used in petrol has cast a shadow over the future of this metal.

Zinc, one of the first metals to suffer from the industrial recession, is showing signs of a recovery, but only by dint of some huge reductions in output, both in the U.S. and Europe. Forced on producers by the heavy losses being made. In Britain, for example, Imperial Smelting's ill-starred Avonmouth smelter has been making huge losses, and although in this particular case the losses may be excessive there is no doubt that producers elsewhere were suffering badly as well.

In these circumstances, the zinc producers in Europe and the U.S. have virtually been forced to make substantial price increases to stay in business at all, but no one pretends that their problems are by any means solved yet with the inflationary pressure on costs of production.

As usual the trend in copper has been the most complicated and confusing. The continued lack of demand, and destruction of a long period of little change, by consumers, has caused prices

to come crashing down from the peaks of over £800 a ton reached in early 1970 to a low of round about £430 a ton in January this year, but since then prices have shot up to well over £500 a ton before coming back to the present level of around £450. Moreover, stocks in the London Metal Exchange warehouses have built

up to an all-time peak of over 100,000 tons. But the decline in values to below £400 a ton, predicted by some pessimists, has not been realised. This is not so much a tribute to any strength of demand, but rather to shortfalls in output which would normally have sent values rocketing.

Production in two of the main producing countries, Zambia and Chile, is much below previous expectations. Zambia is now feeling the effects of the disaster at the Mufulira mine, one of its biggest mines, and Chile has been beset with all kinds of difficulties, including the nationalisation of the copper industry, which has caused an exodus of skilled management and technicians employed by the previous U.S. owners. Peru, too, has been beset by political and labour problems, hitting output severely.

Meanwhile, the world's biggest producer of copper, the U.S., was hit by a surprising across-the-board strike by copper workers who were unable to agree terms of their new labour contracts. Although settlements with several producers were reached after a month, while others took longer to settle the dispute, it is estimated that losses in output totalled some 150,000 tons—more than the size of the LME stocks that have so depressed the London market.

Tales of woe

Despite the tales of woe for the major metals, and their accompanying scrap market, it is the "minor" metals that have suffered even worse from the decline in industrial activity. However, bad conditions may be, activity in March this year, there is always a basic demand

for the major metals and a need to ensure a regular source of supply, but this does not apply to anywhere near the same extent with the smaller volume metals.

For example, consumers such as the steel industry, faced with bad times in their business, tend to cut costs, by reducing stocks and purchases of minor metals such as antimony, bismuth, cadmium, selenium and wolfram (tungsten ore) to the bare minimum. The situation is not helped by countries such as Japan, finding themselves holding surplus stocks and dumping them on world markets at cut prices, especially when the metal concerned is a by-product of another metal, as is cadmium of zinc, and when its price does not directly affect the supply-demand pattern. After a false revival in activity in March this year, prices of most of these minor

metals have now collapsed again to rock-bottom levels. Cadmium prices in Britain have been cut several times this year, while July saw the first reduction in the producer price of bismuth for over 10 years.

Wolfram has fallen to the lowest level since May, 1965, despite virtually nil sales by China, the world's biggest producer, and free-market antimony prices have now dipped below £400 a ton compared with the £3,500 a ton being charged in early 1970. Once demand does start to pick up it is surprising how quickly surpluses disappear and the impact is quickly felt in metals. On a long-term basis there is no doubt that prices of metals will have to keep trend with production costs if supplies are to be sufficient to cope with the world's normally insatiable appetite for the resultant products.

Lead and zinc begin to recover

By R. L. STUBBS, Director General, Lead and Zinc Development Associations

Lead and zinc consumption, like that of other commodities, is still recovering only slowly from setbacks in a number of countries. However, both metals now seem well poised to move ahead again as economic conditions improve, neither being particularly vulnerable to substitution in their main uses. At home, membership of the EEC should bring a brisker growth in U.K. consumption.

World producers' stocks of zinc, which reached high levels last year, have been falling in recent months. The producer price basis for sales outside North America was raised, after a long period of little change, from £127.95 to £150 per metric

ton in mid-June, 1971, and in late-July the price for prime western zinc was raised from 16 to 17 cents per pound in the U.S., where producers' stocks are falling faster than elsewhere. There are signs of a better balance between supply and demand, with zinc at last recovering from the sharp setback in consumption in 1970, particularly in the U.S., which resulted in several American plants being shut down. As consumption began to slow down in other countries as well, some producers announced curtailments in output, and more recently the Imperial Smelting Corporation in Britain closed down some of its production units. These developments can

be seen as the first stages in a major reshaping of the pattern of world zinc production. New electrolytic refineries are being built in several countries and it can perhaps be expected that when these start up, more old plants will be phased out.

Largest importer

The U.K. is the largest single importer of zinc in the world after the U.S. and when it is fully integrated into the EEC it could well draw an increasing proportion of its metal supplies from other EEC countries. However, the enlarged EEC, even taking into account new production, will continue to be an importer and exporter

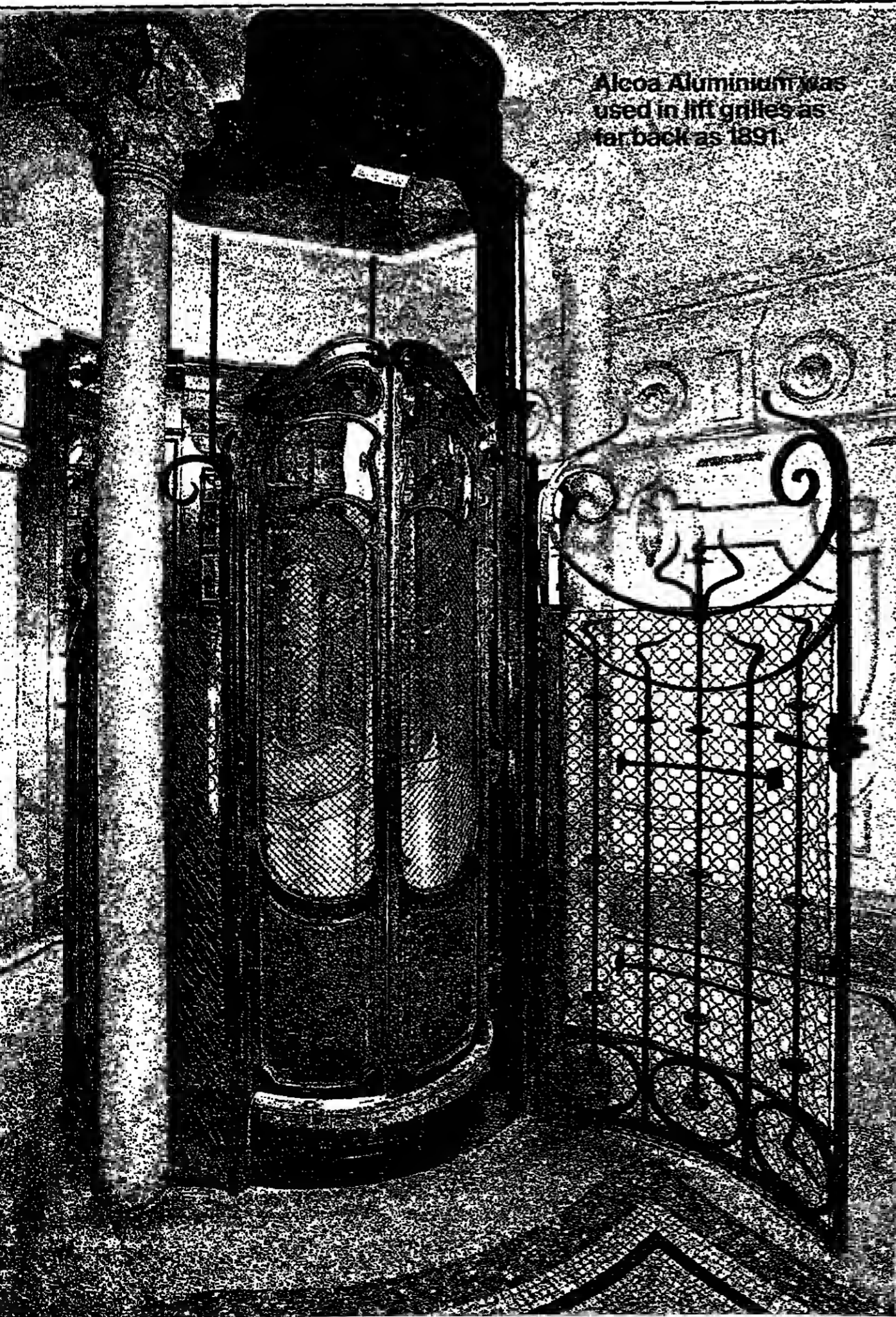
of zinc metal. And in any case will be largely dependent on imported concentrates for its metal production.

Although zinc has lost little ground to substitutes in recent years, questions are now being asked about the possible effect of the recent increases in price. Nevertheless, these increases were not out of line with those of other commodities and with inflation generally.

Strength in zinc consumption also stems from advances in the technologies for manufacturing its main products. There are many examples, such as the continuous galvanised steel strip that is now supplied with a colour-coated finish as the last

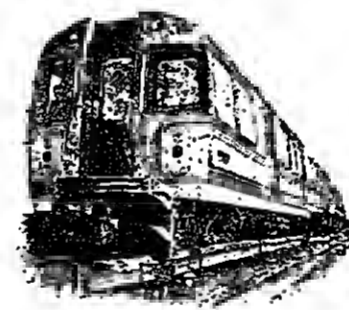
stage in the manufacturing process at steel mills. This new product makes possible more colourful building and is opening up many new applications for an already well-established product. Galvanising of structural steelwork can save maintenance costs by removing the need for periodic painting to prevent rust, and savings are becoming higher as labour costs rise. New galvanising plants are being built in many countries to coat structural steel. Another important new use of galvanising is in protecting reinforced steel for concrete: a thinner cover can be used with galvanised reinforcement.

Continued on next page.



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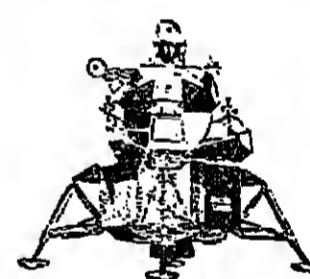
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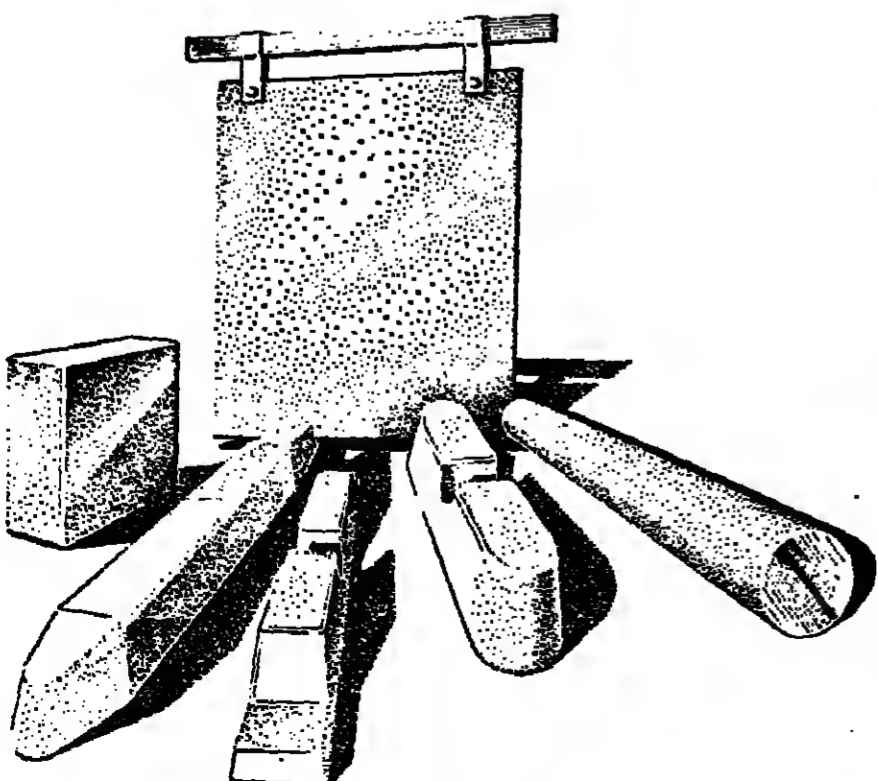
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METALS IN INDUSTRY II

Copper loses some markets but finds new ones

By JOHN EDWARDS

Despite the wild price fluctuations and irregularities in supplies, consumption prospects for copper are promising since it is still the best material available for a wide variety of uses. There is no doubt that copper has lost a good many markets to rival materials, such as aluminium and stainless steel, but it is constantly finding new outlets and indeed recapturing some old markets when prices return to more reasonable levels.

In marginal areas, including certain sections of the electrical industry and building, the various unpredictable rises and falls in the price of copper do tip the balance against it in favour of a steady price material, with assured supplies, but in many applications copper has so many natural advantages that consumers are prepared to suffer the trials and tribulations of erratic supplies.

Scrap value

One big advantage enjoyed by copper is its relative indestructibility, allowing it to be constantly re-used, which means that its scrap retains a high value in relation to the price of the primary material. Thus while an offcut of a stainless steel tube, for example, is worth little or nothing, the same offcut of a copper tube is saleable and goes back into the scrap cycle. The same applies to many of the copper alloys, such as brass, bronze and cupro-nickel.

In the electrical industry the superior conductivity qualities of copper, as well as its ability to be joined easily, means that it remains supreme in heavy electrical generating plant, for instance, and is able to resist the challenge of aluminium in several other areas. Although

electrical engineers have been accused of being too conservative in the past in switching away from copper to the less expensive aluminium, there is an equally strong body of opinion that considers the higher price worth paying for copper since they foresee long-term problems with materials.

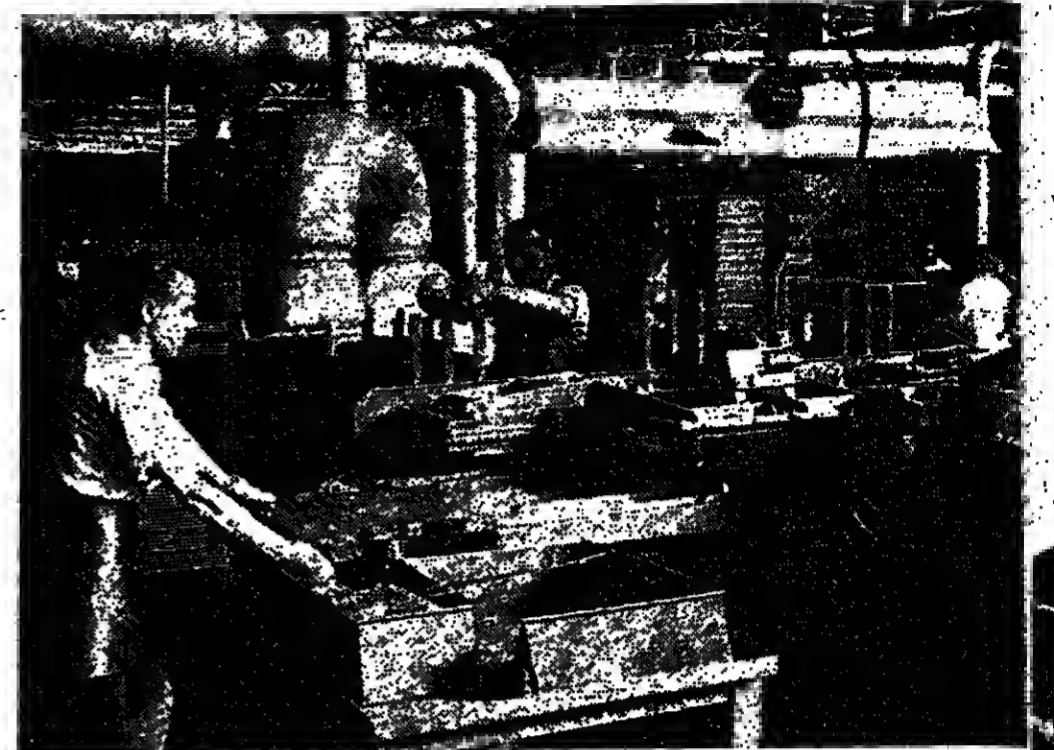
New developments in electrical engineering currently being studied by the Copper Development Association, which is sponsored by copper producers and fabricators, include a method of casting rotor bars in copper which could revolutionise electrical motors, and a new long range waveguide being developed in co-operation with the Post Office.

Another potentially big development is the "mini bore" central heating system, which although reducing the amount of copper used in thinner tubes, should mean an overall increase since the cheaper cost is encouraging greater use of the system in private and local authority housing.

It is hoped that a rolled-form copper window frame may also gain wider acceptance, but as with roofing and other building uses, the price of copper at a particular time is the key to whether or not it is substituted by a rival material.

Copper's anti-corrosion and erosion qualities are also opening up new markets, particularly in the anti-pollution drive, and hopes of making fresh inroads into the chemicals industry have been raised, in Britain particularly, by work on steel tubes with copper linings inside joined by explosive forming.

These tubes, combining the



Copper tubes and fins for motor radiators being loaded before soldering.

strength of steel with the qualities of copper, are not new but progress has been made in Britain to produce tubes with much wider diameters and longer lengths so the range of application can be considerably increased. The quantity of copper used in these tubes is quite considerable.

In the U.S. another big potential market being developed is copper-nickel bulls for boats. Tests on what is claimed to be the world's first barnacle resisting copper-nickel bulled shrimp boat are reported to have been very successful and the way could be open to making similar

hulls for larger vessels, such as oil tankers.

In the road transportation market, research is going on into using copper's heat dissipation qualities in disc brake alloys and providing better wear resistance for carburetors. A different, smaller, version to replace the traditional brass radiators is also being developed, partly to resist competition from aluminium, although copper producers claim the superior welding qualities of copper makes it far easier to install and repair brass radiators.

However, many of the proposed developments will depend very much on whether supplies available are adequate and assured, and consequently prices are kept at a reasonable level around, say, \$450 a ton. Uncertainty about the future supply position, and the price fluctuations, has been an important influence in holding back copper consumption back to a growth rate of less than 5 per cent. annually, far lower than that of aluminium or nickel.

But for the moment at least the prospects of plentiful supplies look reasonably encouraging.

The avoidance of a prolonged strike by U.S. copper workers has removed one uncertainty. Although there are grave doubts about production in Chile, which has been hit by political and technical troubles, these difficulties are occurring at a time when demand is at a low ebb, and there is every hope that normal output will be resumed when the industry settles down again. Meanwhile, several new projects in the rest of the world, with Bougainville in New Guinea being a notable example, at output expansion in existing areas like the U.S., Canada, South Africa, the Congo, and Australia should ensure that supplies available are sufficient to keep pace with a faster rate of growth in demand.

Given that supplies are adequate it should follow that prices remain more stable at a reasonable level although they will need to be adjusted to the higher costs of production eventually. But having said that, the copper market has been a nasty one to make even the most soundly based predictions look foolish.

Lead and zinc - (Cont'd.)

Continued from previous page

ment without fear of rust staining or spalling. Much of the reinforcement to be used in the new National Theatre on London's South Bank will be galvanised, and other new projects include the reinforcement of concrete tide barriers for sea defences in the West Country. Die-casting too is advancing, with greater emphasis on automatic production and on methods of finishing that eliminate hand labour. Zinc alloys are more suitable than others for use in automatic die-casting machines because of their low melting point and ease of banding, and this could be an increasingly important factor in their favour in the future.

Furthermore, economies are being made by using vibratory finishing to prepare castings for plating, so eliminating hand buffing.

After galvanising, brass is the next largest use of zinc in many countries. Consumption has fluctuated in recent years under the influence of the price of copper, its main constituent. Nevertheless, the properties of brass make it the best available material for most of its established uses and so the scope for substitution is limited.

Use in petrol

Lead consumption has held up better than that of zinc, but the outlook is being influenced by attacks on the use of lead in petrol, and this could affect the future level of consumption. On the other hand, new campaigns for a cleaner environment could stimulate a greater use of battery-powered vehicles to the benefit of lead.

World producers' stocks of lead are still high but like zinc they are beginning to fall. During 1970, the price of lead declined sharply, both on the London Metal Exchange and in the U.S. on the LME from \$137.5 to \$117.2 per metric ton and in the U.S. from 16.5 cents to 13.5 cents per pound. This year the LME price has declined further to around \$108 per ton, but the price in the U.S. was raised by 1-1 cent at the end of June.

At present there would appear to be little change taking place in the world pattern of supply for primary lead, but there have, however, been important developments in recent years, in particular the opening up of the new Missouri mines and refineries, which has made the U.S. less dependent on imports.

A large part of all lead used is eventually recovered as scrap, a major factor in the overall supply situation. The cycle of recovery varies, but with batteries now the biggest user of lead throughout the world, and with much battery lead being returned as scrap in

a three-year cycle, supplies of secondary lead are growing faster than those of primary lead.

Lead is fortunate in having batteries as its main use, since the demand for lead starter batteries is inevitably expanding with growth in motor vehicle populations, most cars requiring about four batteries during their lifetime. Also there are very good prospects that the market for lead batteries for driving vehicles of all types will increase steadily.

The advantages of electric forklift and similar trucks, fume free and quiet, in factories and other enclosed spaces are already well appreciated. Although battery-driven road vehicles can not as yet challenge the conventional automobile for general use, the possibility that i/c-engined vehicles might have to be banned from city centres in order to reduce atmospheric pollution is stimulating the development of battery-powered cars and vans, and even buses, for town use. Despite talk of new types of batteries being developed, only the lead battery is at present practical for general use, as already demonstrated in Britain for vans delivering milk from door to door.

The lead battery itself is a highly developed means of storing electric power, having steadily undergone technical improvements over the years. Now there is the prospect of sealed batteries, requiring no topping up, becoming generally available for new vehicles during the next few years. These batteries will use grids of lead containing a small amount of calcium instead of the conventional lead-antimony alloy.

Major market

Anti-knock compounds for petrol to-day take about 350,000 tons of lead a year, 12 per cent. of the free world total. This is a major market in the U.S., where consumption is currently 350,000 tons a year, 20 per cent. of the total refined lead used in that country, and there is also production in Canada and Mexico. Europe's production of anti-knock compounds (U.K., France, Germany, Italy and Greece) takes about 80,000 tons a year, 5 per cent. of the total.

For all practical purposes lead additives are essential for the economical production of the high-octane gasolines required for the high compression engines of modern automobiles. Now the question is raised as to whether the lead in automobile emissions has become a hazard to health, or will hinder the development of emission control devices, and there are widely different expert views. In Europe, however, Sweden and Germany have already placed maximum limits on the lead content of petrols. In the

U.S. the Clean Air Act requires a reduction of automobile auto emissions by 90 per cent. by 1975, and most automobile manufacturers maintain that this can only be met by fitting catalytic devices, which will not work with leaded gasoline. It seems probable therefore that there will be a gradual reduction in the use of lead additives in the U.S., but of course for some years there will be many cars on the road designed to use high-octane gasolines, for which lead additives are normally required.

Lead has a wider range of uses than zinc, which is one reason why its total consumption is steadier. All the main uses of lead are well based on its technical properties, and changes in the pattern of consumption take place only slowly. Substantial markets will continue in cable sheathing, lead sheet for building, solders and printing metals and compounds, and there are promising new lead products and applications such as sound insulation, lead/steel laminates, radiation shielding and new organic lead compounds, which although small now should grow in the future.

Strong growth

Zinc and lead both enjoyed strong rates of growth in consumption in the 1960s. The yearly average for zinc was about 6 per cent., with increases in 1968-69 of 11 per cent. and 81 per cent., to reach a free-world total of 4.14m. tons. Lead consumption grew at a rate of about 4 per cent. a year, and by 5 per cent. in 1968 and 7 per cent. in 1969, to reach a level of 3.15m. tons. The setbacks in 1970, when world zinc consumption fell by 41 per cent. (about 18 per cent. in the U.S.), and lead consumption rose by only 1 per cent., should be seen against the good performance in recent years. World demand for both metals is still at high levels.

However, in the U.K. consumption of both metals has been disappointing in recent years, reflecting general economic conditions.

The U.K. lead and zinc industry, through its well-established associations and by the efforts of individual companies, has been in the forefront of new thinking for marketing lead and zinc and their products and have thus played a leading role in stimulating the expansion of co-operative promotional and technical services throughout the world. This progressive approach to marketing, coupled with international research programmes, and now with the improving prospect for a reasonable balance between supply and demand, place lead and zinc in a strong position to respond to renewed growth in the world economy.

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METALS IN INDUSTRY III

Slack period for aluminium

By JOHN EDWARDS

Aluminium producers are caught in a difficult dilemma at present. Unexpectedly poor demand in the past two years, during a period when the U.S. in particular has suffered an economic recession, has created a surplus of supplies. And with the new production capacity planned in earlier optimistic days coming on stream, there is every prospect of supplies continuing to be more plentiful than demand for the next two or three years at least.

In these circumstances a rise in prices would hardly be advisable, especially since aluminium's competitiveness against rival materials is based very much on its relatively low

and stable price. But like everything else these days costs of production are rising inexorably, pushed still higher by the necessity to cut back output well below the 100 per cent. of capacity where costs are cheapest.

Some people believe that the aluminium producers might do better on improving profitability, by charging higher prices and selling smaller quantities, but for the next few years at least the traditional policy of keeping prices as low as possible and selling as much as possible is likely to be followed.

Much depends on how soon the U.S. economy starts to recover, bringing a revival in

industrial activity, but meanwhile aluminium is making strenuous efforts to break into various new markets.

Transportation, including the car industry, is the largest user of aluminium and still offers some of the biggest potential. Aluminium companies claim that research and testing has now overcome past technical troubles with aluminium car radiators, making it price competitive even if copper remains between £400 to £450 a ton. Good progress has been made in the development of aluminium cylinder blocks and also with the all-aluminium engine, which has been used for General Motor's latest subcompact model, the Vega, in the U.S.

In Britain the expected growth in popularity of automatic transmission systems could bring increased demand for aluminium, since their manufacture requires a far bigger proportion of aluminium castings. So assuming automatic systems do substantially enlarge their present 15 per cent. share of the market in the next few years—following the precedent set in the U.S.—a significant new market for aluminium could be created.

Car grilles and electrical equipment are two other areas where aluminium is pressing hard, but it is being challenged by rival materials especially in car trim where fashion changes can ignore price competitiveness.

Aluminium has won most of the "easy" markets in electricity from the erratically priced copper, so the going is that much harder nowadays. But the development by British Insulated Callender's Cables of the copper-clad aluminium wire, enabling better jointing, has widened the potential scope for further expansion. Inroads are being made into post office telephone cables and railway signals, as well as the domestic wire market.

Drinks market

In the packaging field aluminium has made great strides in providing the soft top and bottoms for beverage cans with the tear off opener, which has revolutionised both the alcoholic and soft drinks market. But a changeover to the all aluminium can seems unlikely in Britain, particularly, where tinplate is more competitive than elsewhere.

Of more promise is the foil and rigid foil container market, which it is reckoned still has a lot of growth. The increasing use of refrigerators and deep freezing units is continually boosting sales of foil, while the use of rigid foil containers for cakes, pies, ready to serve meals and convenience foods generally is on the increase.

However, probably the fastest growth market for aluminium is in building. Double glazing, window frames, partitions and decorative cladding are just some of the growing uses for aluminium in industrial and private building.

With the three big new aluminium smelters coming on stream in Britain, and pressure from imports building up, there is little doubt the aluminium producers are going to remain under considerable pressure for some time yet. Indeed some sources do not expect any increase in the price of primary aluminium ingots, from its present level of £257.2 a metric ton, for several years.

It is no secret that at the moment the aluminium producers are heavily discounting the official quoted price, reducing it to around £200 a ton on occasions, while on the free market aluminium is trading as low as £170 a ton.

Futures market

The London Metal Exchange has an ambition to start an aluminium futures market to provide an independent pricing medium and hedging facilities against price fluctuations, but the producers are implacably opposed to the idea while consumers would hardly welcome the kind of fluctuations that make copper pricing and stocks a nightmare. The odds are, therefore, that even if the Metal Exchange does go ahead with the project, it will have difficulty in obtaining sufficient regular supplies to service dealers properly, and trading is more likely to be concentrated among merchants or dealers.

Meanwhile the producers are taking direct action to avoid the burden of too adequate supplies. In the U.S., by far the world's biggest producer of aluminium, all the biggest manufacturers have now cut back their output substantially and have postponed or even cancelled some of the expansion plans scheduled.

But it should be remembered that once industrial activity in the major consuming areas in the U.S., Europe and Japan returns to normal, world output has to rise by an average of 8 per cent. annually to keep pace with consumption. Over the years it has been found that bad years, when the growth rate of consumption falls well below the 8 per cent. average, are inevitably followed by boom years when demand zooms well above average.

A parallel for the aluminium industry is the period from 1959 to 1965 when supplies were in surplus, discouraging further expansion, followed by the boom period of 1965 to 1969 when supplies were scarce. Much the same is expected to happen this decade.

Keeping pollution under control

By E. C. MANTLE, Deputy Director, British Non-Ferrous Metals Research Association

Present concern about the environment is possibly the first evidence that society is really beginning to bother itself about technology. Hitherto it has accepted the fruits of the technological revolution, on the whole without too much heart-searching. Now society is beginning to think about the consequences. This is happening all over the industrialised world. Many want to get in on the act, and environmental control means vastly different things to different people. Public debate seems to be largely the prerogative of the politicians, ecologists and preservationists. Action must lie mainly in the hands of the industrialist and technologist.

Global problem

Total pollution, that is, the total quantity of pollutants being pushed into the atmosphere or poured into rivers, lakes and seas, is, of course, a global problem. Ignorance exists both about the quantities and the ultimate fate of many of these pollutants; whether they are accumulating, what their cumulative effects may be. Soon this will have to be tackled internationally, but at present each country is concerning itself with its own immediate problems. Legislation varies considerably, and the degree of enforcement even more. Sometimes apparently severe regulations turn out to be no more than pious hopes where enforcement is concerned. Indeed, it is probably a mistake to promulgate too stringent requirements since enforcement could well cripple an industry. Anti-pollution measures are expensive and almost invariably an added production cost. The remedies can best be sought and the costs borne by a prosperous industry. Encouragement for progressive improvements towards the ideal is likely to be more rewarding than a crusade against industry.

The more moderate approach has in fact been conspicuously successful in this country and great progress has been made

in reducing pollution levels, particularly over the past decade. It is a justifiable claim that we have completed stage one, the containment of pollution; our atmosphere is cleaner and our waters more wholesome.

The non-ferrous metals industry, although certainly not one of the major sources of pollution, has tackled its problems realistically, and the U.K. has a lead in practical achievement over virtually the rest of the world in effluent treatment and in air pollution measures. Heavy metals such as copper, nickel and zinc, while beneficial in small amounts to some forms of life, are toxic towards fish in anything more than trace quantities. Their effects on biological sewage treatment is less marked, although sufficient to make large concentrations unwelcome. The copper industry therefore has for many years had to take steps severely to limit the quantities of these elements released in effluents. Experience gained in the design and operation of effluent treatment plants was incorporated in a Manual published in 1965 by the British Non-Ferrous Metals Research Association, which has been translated into French and German and is recognised as an authoritative book on the subject. The construction of effluent treatment plant is fast becoming a considerable industry.

Water shortages

Allied to effluent treatment is the question of water conservation. We are impoverishing our resources far too rapidly, and the possibility of severe water shortages faces many industrialised countries. A survey of the non-ferrous metals industry of Europe confirmed that the major water usage was for cooling purposes. This water is only "contaminated" by heat and practically all can be reused after treatment with significant financial savings. Water not only has to be bought, but after all, is waste, and a frequently there is also a pay-reflection on our technical competence.

A companion volume to that on effluents has been published on water conservation in the industry, dealing particularly with the design and operation of recirculating cooling systems.

A considerable co-operative effort engineered by BNF has enabled answers to be found for the more important air pollution problems of the copper and aluminium industries. Regard has had to be paid to the effectiveness of the measures, to practicability of operation under works conditions and to economics. Some apparently attractive methods have, in fact, proved impracticable after long-term pilot trials. Close liaison has been maintained throughout with the appropriate authorities, in particular the Chief Alkali Inspector, and satisfactory solutions have been agreed for the major problems; though the search for better techniques continues.

Close interest

Through its important international membership the BNF has been in a favourable position for keeping in touch with progress overseas. Where alternative approaches are being tested they are being watched with close interest. The BNF organised a successful conference on "Air Pollution and Water Conservation" in Basle in 1969, gathering together experts from several countries concerned specifically with the problems of the non-ferrous metals industries.

Stage one in the reduction of air pollution has been completed; but clearly there will be a stage two, requiring more stringent measures and necessitating continuing research effort. Often the answer must lie not so much in more rigorous control of pollution, but rather in seeking new processes inherently less pollution-productive, and this approach is mirrored in current research. Pollution, after all, is waste, and a frequently there is also a pay-reflection on our technical competence.



A horizontally sliding aluminium window undergoing tests at the British Standards Institution's Hemel Hempstead centre.

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METALS IN INDUSTRY V

New welding techniques offer cost advantages

By TONY FRANCE

For industrial fabrication the most commonly used non-ferrous metals are aluminium, copper, nickel, titanium and magnesium, together with their wide range of alloys such as brass, aluminium-bronze and nickel alloys. Unfortunately non-ferrous metals when heated react with the atmosphere to a greater degree than steel, which makes them more difficult to weld.

Friction welding is one of the few processes which produces successful welds between dissimilar metals. When a really large machine was installed at the British Aluminium's new smelter at Invergordon, friction welding made an impact in the non-ferrous world. The machine at Invergordon is used to weld the anode hangers for the smelter lines, providing joints between the massive aluminium bus-bars and the steel anode hangers, producing a joint with a cross-sectional area of over 20 sq. in. in about 1½ minutes. It is estimated that savings of up to £35,000 a year over other methods of making these joints will be achieved.

The cost-saving aspect has aroused interest for other non-ferrous applications, for example, in the manufacture of long phosphor bronze bolts. These are traditionally made by machining from hexagonal bar, but by friction welding a smaller diameter length of round bar to a short length of hexagonal bar (to provide the head), a considerable reduction in metal wastage (as swarf) and in machine time could be achieved.

Titanium is another metal that produces welding problems because it is extremely reactive when heated in air—with friction welding no protective atmosphere is required to shield the weld area, and titanium components of circular section present no problem.

A development in friction welding is a prototype sensing system which will lead to automatic monitoring and finally to automatic correction if any parameter of the machine cycle seems likely to result in a faulty weld. (The Welding Institute has applied for patents on the system.) The prototype device provides control of the friction welding machine by adjusting only two settings—one knob controls the dynamic conditions at the interface, the other the

duration of the conditions for a complete weld cycle. This means that from a simple chart the operator has only to make two adjustments each time he uses a different metal, or combination of metals—changes of diameter do not require new settings, apart from chuck fitting.

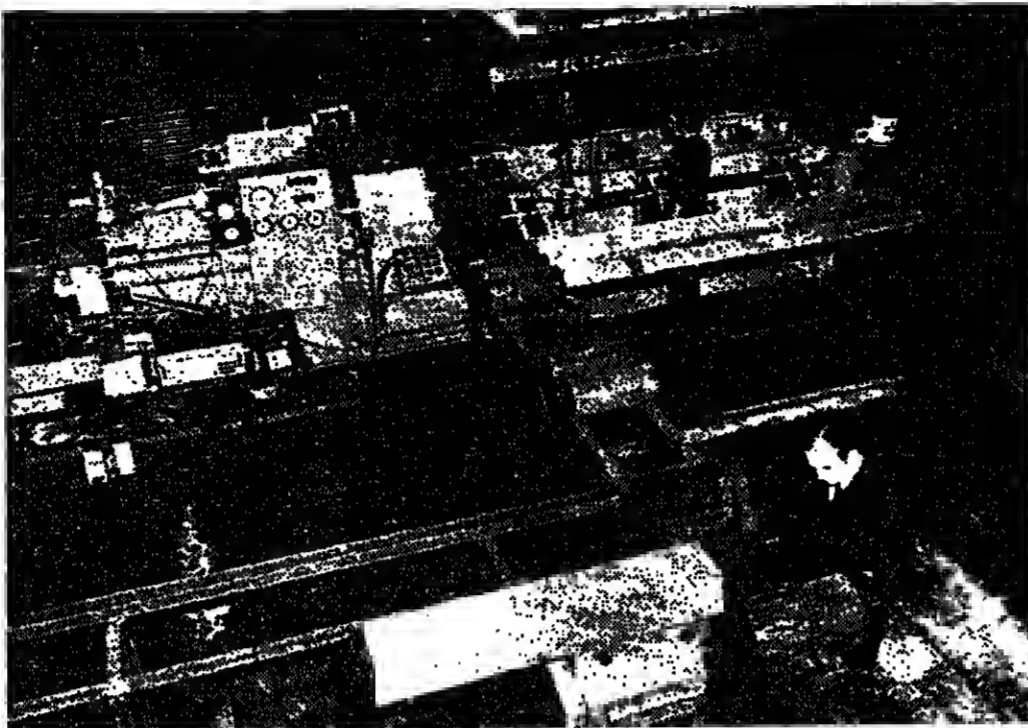
Microfriction welding is on the point of commercial exploitation and many forms and combinations of materials have been welded, including 1 mm diameter nickel-iron alloy pins to 0.3 mm thick nickel-silver cans (for electronic components), and 1.7 mm diameter tungsten carbide drill tips to 1.7 mm diameter stainless steel shanks for dental drills.

Different approach

These descriptions of friction welding refer only to the conventional or "continuous drive" type. In the U.S. "inertia" or "flywheel" friction welding is widely used, where the kinetic energy of a flywheel being brought to rest is used to provide the energy. An entirely different approach to friction welding has recently been developed in this country in which the longitudinal axes of the two components are made to revolve about a common centre. At the end of the weld cycle, the axes are aligned and forging pressure applied. This approach, called "orbital" friction welding, enables components of other than circular section to be joined, for example, I-section bar up to 1 inch wide has been successfully welded with all faces properly aligned.

Electron beam welding machines are now being made as small, relatively inexpensive, units able to turn out components at high production rates. Metals with dissimilar melting points and thermal conductivities can be joined by melting one of them on to the other, for example, copper to tungsten. Among the items now being welded by this method are beryllium copper anode capsules, and relays with glass to metal seals in the vicinity of the weld.

At the other end of the scale, The Welding Institute is developing an electron beam gun which it is hoped will eventually operate at a 75 kW output—this will weld steel up



A friction welding machine at work producing aluminium/steel anode hangers for the new British Aluminium smelter at Invergordon.

to 6 inches thick and aluminium alloy up to 12 inches thick. Admittedly there are no applications for 12 inch thick aluminium which immediately spring to mind. The Americans have built a submarine in 8 inch thick aluminium, but that was bolted together. The thought of single pass narrow 12 inch deep welds is attractive—and may lead to very thick aluminium pressure vessels for cryogenic chemical engineering applications, or, a more likely application, for welding smelter bus-bars. These are increasing in size and can be of the order of 3 feet by 8 inches in section. Although the electron beam machine would not be a feasible proposition for site welding, it could certainly be used for producing "specials," for example, awkward joints and shapes in bus-bars and connections.

With a high-powered electron beam gun it is possible to obtain a long narrow beam of almost uniform section. This means that it would be possible to weld die-cast sections of a massive aluminium engine block, up to 12 inches thick, completing several welds at different locations (in the same place) in a single pass. The process could also be used for the multi-layer or composite main structural members of aircraft frames.

Copper problems

Copper is a metal which, because of its high heat conductivity, is difficult to weld. It poses problems of high pre-heat temperatures, and welds are subject to lack of penetration defects. Both these difficulties are overcome by electron beam welding, which can easily weld ½ to 1 inch thick copper, about the maximum thickness encountered in chemical engineering and electrical applications and of course the most difficult to weld by conventional processes.

Other possible applications for electron beam arc for welding the high-strength aluminium/zinc/magnesium alloys developed for armour and military bridges; and for a new approach to fabricating ship's propellers in aluminium bronze. The spinner and the blades could be cast separately, and the blades welded at the roots, using single passes up to nine inches deep. This could simplify fabrication problems for big propellers.

Pulsed tungsten inert gas welding, a process invented in 1960, is attracting increasing attention among non-ferrous metal fabricators because of the very accurate control of both penetration and metallurgy that it offers. In its simplest form TIG pulsed arc welding is a pro-

cess in which the arc current alternates between two levels, for example, 120 A and 5 A, in cycles of ½ second at each level. At the high current, heating and fusion take place and at the low current (which is enough to maintain the arc) the weld nugget cools and solidifies.

An outstanding example of the industrial use of TIG pulsed arc welding is the joining of copper commutator bars on traction motor armatures to the copper windings. The effect of unavoidable changes in fit-up and hence changes in the heat sink are minimised by using short durations of the welding current pulse and uniformity of penetration is thereby ensured.

There can be little doubt that the process will be used extensively in the welding of non-ferrous materials, especially in cases where there is a difference in thermal conductivity or thickness between the parts to be joined. The system is amenable to programming since welding of a long seam takes place as a sequence of discrete events. A recent development at The Welding Institute will improve the advantages of using pulsed TIG for welding thin non-ferrous metals—pulsed alternating current, instead of the conventional direct current, enables the mean weld current to be held low enough to reduce the formation of oxides which could cause weld defects.

Nickel alloys up to ½ inch thick can be welded almost without distortion using pulsed TIG. But this process could be faced with real competition in the precision joining of non-ferrous metals in the immediate future. Already the 1000 W laser at The Welding Institute has produced excellent welds in 1/10 inch thick nickel alloy, and the Institute will soon be working with powers up to 2000 W. Laser welds are similar to electron beam welds and have all the advantages of electron beam without the problems of having to work in a vacuum. With the increase in power output lasers will become increasingly competitive whenever joints with no distortion and minimum heat-affected zone are required. Commercial laser welding machines should be considerably cheaper than electron beam equipment.

Explosive welding of tube-to-tube plates in heat exchanger plant and explosive welding or cladding of thin sheets of expensive non-ferrous metals to steel is becoming commercially important. For example steel plate ½ inch thick costing about 5p/lb can be explosively clad with titanium 1/10 inch thick costing about £3/lb—the plates can be used in the fabrication



A prototype microfriction welding machine developed by the Welding Institute for the Department of Trade and Industry.

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METALS IN INDUSTRY VI

Reclamation methods improve

By ANDY McELROY

Recycling of used materials has become fashionable over the past five years, mainly as a result of concern with pollution. Now there are suggested schemes for recovering and re-using almost every type of product, from waste gases to plastic containers.

In some industries, however, this accent on reclamation has been in evidence for anything up to 300 years and perhaps, in some instances, even longer. Such long-standing frugality cannot be claimed for metals, but recovery and re-processing, at least of the more common materials, has been going on for long enough to make it an industry in its own right.

Reclamation of metals in their elemental form—copper from cables, lead from pipes, aluminium from saucepans—is a simple and straightforward task, involving low costs and fairly high returns. Even some common alloys—brass and bronze, for example—are useful for recycling although they are, in the strictest sense, not chemically reformed but merely re-worked into new products. Separation of such alloys into their constituents is seldom worth while.

But this is not universally so, and the number of exceptions is growing steadily.

As with any operation in industry, its value depends on relative costs of alternative sources. Sudden rises in the cost of the virgin metals—and there have been plenty of these in the past ten years—cause industry to take a fresh look at the economics of reclamation processes once rejected as too costly. It is exactly the same mechanism as has prompted mine-owners to reopen poor metal ore seams once by-passed in the search for rich and easily extracted sources.

Reclaiming metals from their alloys is seldom difficult technically. Chemical and electrolytic methods exist for most separations and can be applied as and when costs reach the crossover point against extraction and refining of ores.

Separation in another sense is still the main problem in the recovery of metals and metal alloys themselves, however.

Companies concerned with scrap are still in the situation where identification and positive separation are costly and time-consuming, so that a large part of the available and useful metals are discarded as complete waste.

Ferrous metals present no problem, since simple magnetic separation is available cheaply. But the multiplicity of various metals and their alloys used in, for example, the motor-car, make hand-picking the only practicable way of categorising. Wage increases make such methods constantly more expensive, and can bring profits down to vanishing point. But what, at present, is the option? Is there any way in which this increasingly important separation can be done?

Strictly limited

Until a few years ago, except for the precious metals, the answer would have been a categorical no. Even to-day, the scope of commercially available systems is strictly limited, but research both in this country and overseas indicates that the day may not be very far off when the scrap metal industry will have equipment that will automatically identify and sort a wide range of mixed metals.

Systems tried so far fall into three main categories: mechanical, using the different densities as a way of differentiating between one and another; electrical, using induction techniques; and chemical, where specific solvents are used to separate the different metals. Although each of these has been shown to work satisfactorily in controlled conditions and with a restricted range of materials, it is likely that the complete solution will only come when two or even three are used in combination.

This will demand, of course, that the industry invests much more on capital equipment than it has done hitherto. In turn, this plant will only be economic when applied on a large scale with a constant throughput of large quantities of mixed scrap. What will happen, inevitably, is that the scrap industry will become concentrated into a comparatively small number of highly complex and highly

mechanised installations located by the major sources of scrap which also tend, fortunately, to be near the main customers.

Further down the industry, scrap collection will, as it has already tended to do, become more highly organised, with the operators of separation plant calling the tune rather than waiting for the largely adventurous loads that are the norm at present.

An inhibiting factor in this development will be the continuing uncertainty about metal prices. There is a general upward trend, but within this there are quite severe fluctuations that are the cause of much uncertainty. Reclamation of metals has always been a bit of a gamble, but mainly one concerned with only comparatively small capital outlay. How soon the industry will be prepared to take similar risks with perhaps ten times as much money remains a matter for conjecture.

Computers find new applications

By TED SCHOETERS

Slower than their counterparts in the iron and steel industry to apply automated process and production control systems to their manufacturing operations, the non-ferrous metal producers and manipulators nevertheless have some significant projects to observe and emulate.

Held back hitherto because of the multiplicity of products which are turned out in much shorter production runs than for steel strip, for instance, which made the introduction of computer control that much more complicated, many of the relatively small companies in the industry could be entering a new era in manufacturing techniques.

Cost reduced

This is because the cost of small computers suitable for the relatively simple control loops which could improve productivity quite considerably, in several areas has been coming down with a rush and their simplest versions hardly go into four figures.

At the same time, the industry's own Research Association has made a big effort to tackle problem areas with its own mobile diagnostic tool—a rugged version of an Argus 500 mounted in its own vehicle—and has made the results freely available to member companies. BNF was one of the first, if not the first, in Europe to have such a facility, which cost £50,000 when it was supplied two years ago.

A first task carried out with this ubiquitous machine was to "listen-in" to the BNF's own pressure die-casting machine and provide a better understanding of how the machine functioned than experimental staff, or even manufacturers, had acquired at any time before. This was due in part to the great speed and the number of measurements possible with a machine of this type.

Armed with this knowledge, the unit was sent out to examine a number of other types of machine, and, by defining what the team calls "areas of uncertainty," it succeeded in finding ways of improving output considerably. The team did not criticise the builders of the equipment—it was a fact that no builder had so far had the opportunity of using such a sensitive tool to study his design of die-casting unit.

Furnace control

Although few areas are so far ready for automatic control schemes, the members of the Association are taking notice of what has been achieved and implementing some of the results with favourable effects in their own works.

Meanwhile, a similar analysis project, but this time applied to furnace control, is ready to provide useful data for the industry. The diagnostic computer was taken for a fortnight to the Pechiney (Cegedur) aluminium centre near Clermont-Ferrand and linked to a furnace there to gather enough data for BNF staff to be able to derive a mathematical model of a melting furnace operation, which will have a very wide application.

According to John Robertson, who led the BNF team in France, furnace builders for the past 50 years have been guided

by rule of thumb methods and not by a scientific approach. But Cegedur and other similar companies in most of the European countries are extremely interested in the outcome of the work, which should in the near future yield data which will permit operators to run their furnaces at optimum levels through a better knowledge of just what happens during the process and therefore through a better ability to control the behaviour of their equipment.

The next stage, and it is not too far distant, will be to devise instrumentation and programs which will give operators some reactive control of the process.

Within six months to a year BNF will be in a position to advise potential users of small-scale computers on the possibilities of applying these stripped-down machines to save on fuel and improve the throughput of metal. The computing team can already provide guidance on automation in many other areas. At the other end of the scale so far as computer sizes go is the use of dovetailing procedures, which permit a designer to work out a complex section of an aircraft frame or wing by a "conversation" with a computer terminal. This process can result in the production, finally, of the control tape for the machine-tool which will cut alloy for the finished section, however intricate this may be.

Man-hours gain

An example of this technique in Britain is the Numerical Master Geometry program suite, first developed by BAC (Weybridge) for use on the BAC 1-11 and Concorde, which has resulted in a considerable gain in man-hours in the mould loft at Weybridge.

Subsequently this NMG facility has been offered generally by ICL to users of appropriately sized 1900 machines for the generation of difficult shapes starting from the simplest sketch. This application involves the final product, which may be a highly sophisticated piece of equipment. But it is at the "bedrock," so to speak, that the earliest applications of automation were made. Several years ago, Elliott - Automation delivered what was then the first computerised spectroscopy equipment able to provide continuous, on-stream analysis of a flow of metalliferous ore through a processing plant to give a constant indication of copper, iron and titanium content.

The user, Palabora Mining in South Africa, needed the equipment to by-pass intolerably slow chemical analysis methods demanding several hours during which process stream quality could fall off badly. It is true that the unit was based only on a small analogue machine from Elliott-Automation. But its immediate successor was a much more ambitious system, controlling five flotation streams for Boldens Gruv (Sweden) containing iron, zinc, copper, lead and arsenic.

Since those heroic days it has become a matter of routine to include a small computer as the heart of mass spectrometry equipment, and such is the rate of progress that in the very near future International Nickel will be unveiling at its Birmingham Research Laboratory the first installation in Britain of a

new combination of spectro-meter and computer for the analysis of complex experimental alloys. A Philips product, the unit will do in minutes work that a skilled analytical chemist might need weeks to carry out. Computer techniques have made a major impact in some areas when the immediate benefit was clearly definable and the potential users economically powerful enough to find quite extensive development work. General application by the smaller organisations in the non-ferrous industry has had to wait the very recent appearance of the stripped-down mini- and micro-machines which are making it economical, for the first time, to use computers where in the past sequential control or staff on dial-watching routines would have been required. Because there is much competition in the market, prices are probably at an all-time low and potential users should begin to think of applications now.

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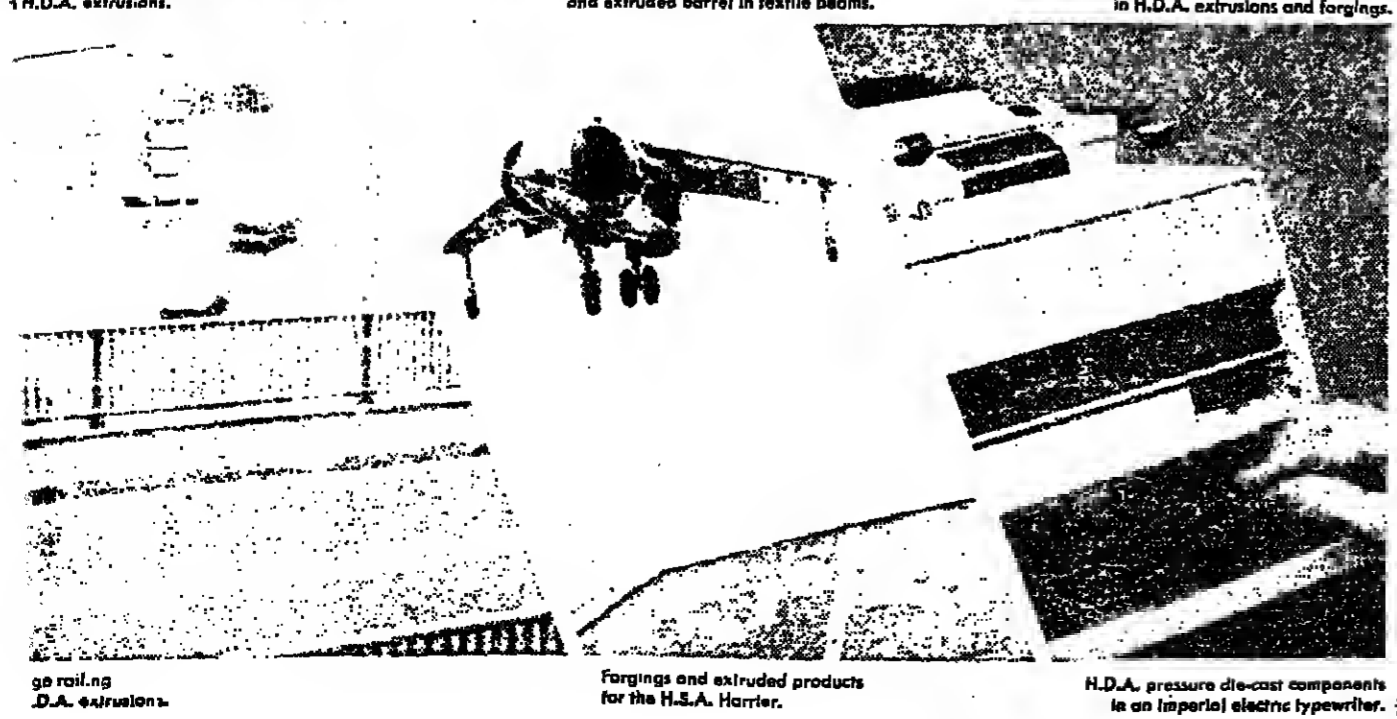
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ECONOMIC VIEWPOINT

Trade, not money, is the problem now

BY SAMUEL BRITTAN

FORE discussing wider aspects of the world currency trading scene, one should observe the British Government's brilliant coup of last night when the pound was floated "for the time being".

Not only did the authorities themselves of the embarrassment of the pound's fall, but the fact that the pound's fall was a result of a deliberate policy, a move which might have been quite unworkable in the face of a flood of dollars, but they so inconspicuously, quietly and with a minimum of controversy, domestic or international.

The undeclared secret hope of many past British Chancellors, of "floating the pound from within", has now been achieved. But the theoretical affirmation of the \$2.40 parity, which now has no operational meaning, has so far succeeded beyond the wildest hopes of those who drafted the announcement. This wording has made a new policy acceptable to the public and others who are only committed to fixed exchange rates.

Yet by its actions, Britain followed the German example. The British Treasury has ably avoided any major revaluation of sterling, which would have been detrimental to its interests, yet by allowing some modest upward movement of the dollar, Britain has made an appropriate contribution towards the currency alignment on which the Americans are insisting as a condition for the removal of their surcharge. Yet this help has been provided in a way that has avoided antagonising the British Government's public relations, has not hit the "good Europeanism". Nevertheless, despite all the

'Despite all the subtleties, the U.K. is on a genuinely floating rate, with no fixed limits in either direction. The \$2.38 floor... can be changed at any time, without a fresh act of policy.'

\$2.38 floor should be quietly dropped at an opportune moment while sterling is still strong.

Assuming this is done, all options will remain open for the longer term. There can then be a large appreciation of sterling in the event of a British "economic miracle" or a gradual and timely depreciation if the more conventional view about Britain's place in the international inflation stakes, and of the effects of EEC entry on the country's overseas payments, prove nearer the truth. It is particularly important to pay this tribute, as the Treasury's strongest point.

Although many other countries will also be floating in a similar way, some have still to take a clear-cut decision. By far the biggest source of confusion at present is the delay of the Japanese Government in deciding by how far and by what means to allow the yen to appreciate. French financial circles are also highly dubious of the ability of the French Government to maintain a fixed and unvalued parity against the dollar for current transactions if the floating "financial franc" should rise too high above it.

The transition to flexible rates has come, as has always seemed likely, as a result of the breakdown of the system of so-called "fixed exchange rates". The transition cannot therefore be as smooth as if it had taken place as part of a deliberately planned move, and it will take time for markets to settle down. Even so, foreign exchange markets may well settle down much more smoothly and quickly than the pessimists suppose, especially when the yen situation has been clarified.

Ultimately there will have to be a new set of rules for the international monetary system.

But those who talk about conferences, initiatives and gestures have their priorities wrong. In particular, it would be a mistake to try to fix a new set of international parities too quickly. The negotiations of dozens of exchange rates, which would have to be right in relation to each other as well as the dollar, would be a hazardous undertaking, and the best chance of achieving a realistic pattern of rates is to allow the foreign exchange markets to find their own level with the minimum of political interference.

It would have saved a great deal of confusion if the U.S. had declared its intention of reopening the gold window at a new and slightly higher official price, thereby indicating the effective devaluation of the dollar at which it was aimed. Such a change could still not be ruled out as part of any international monetary settlement.

It is also an open question how long national monetary authorities will continue to value their gold stocks at the "official" price of \$35, which is now devoid of meaning, at a time when the free market price has been drifting above \$43. Some understanding will have to be worked out about the valuation of gold in settlements between governments and central banks. The future of the Washington Gold Agreement, under which the major monetary authorities undertook to abstain from buying or selling in the free market, will also have to be determined.

Looking further ahead, the whole question of the composition of national monetary

reserves—now uneasily divided between gold, dollars, sterling and SDRs—may require some concerted action. The proposals for a new composite reserve unit, into which all the others will be merged, are tempting. But no one should forget that the international authority running such a unit would wield considerable political powers and involve a substantial sacrifice of sovereignty on the part of member nations.

These are not, however, the most immediate, nor even the most important, international economic questions. Given that he was not prepared formally to devalue the dollar against gold, shutting the gold window was the next best move that President Nixon could have undertaken. At a stroke he abolished the U.S. balance of payments problem and the fear of the gold

'It looks suspiciously as if the President decided to take all or most of his options in the desire to be decisive. Thus we have both dollar depreciation and the measures prepared to avoid it.'

stocks running out. To the extent that other countries have responded by floating their exchange rate, it should have abolished the balance of payments problem and the fear of currency crises for them, too.

The real and severe criticism that history may have to make of President Nixon is that he

accompanied the floating of the dollar by the import surcharge, "buy American" tax cuts and other protectionist rhetoric and gadgets. Such measures might have had their place as a substitute for the exchange rate decision, not as an alternative to it. It looks suspiciously as if the President, presented with a number of alternative options, decided to take all or most of them in the desire to be decisive. Thus we have both dollar depreciation and the measures prepared to avoid it.

The most urgent and vital issue is therefore not some "new Bretton Woods" but a concerted attempt to put a time limit on the U.S. surcharge and the latest devices and to prevent retaliation by other countries in a profitless game of tit for tat.

In terms of international trading logic the Americans should withdraw their protectionist devices whatever the Japanese do. If they wish to give away goods without importing anything in exchange except paper dollars, it is the body of Japanese citizens who lose and the Americans who gain. But unfortunately, within that body of American gainers, there is a minority of producers sharply hit by Japanese competition and it is necessary for political reasons—as it has been with Lancashire and Asian textiles—to regulate and slow down the pace of readjustment and transfer to other activities.

This is the real connection between the trade and currency issues. The French do not occupy this role in the American market and if the French wish to accumulate dollars at the expense of the real standard of living of their own citizens, the rest of us do

not need to lose too much sleep over it.

There will doubtless be an attempt by the IMF and other bodies to get back to what is regarded as the "true" Bretton Woods system. By this they mean a system under which exchange rates remain normally fixed, but governments are

'The concept of EEC monetary union has always seemed a classic case of putting the currency cart before the political horse. Nevertheless, such a joint move could well be attempted.'

prepared to change them when they can be shown to be out of line. Unfortunately, such a system tends in practice either to ossify into one of exchange rate rigidity or to crumble away into floating rates.

Similar troubles apply to the concept of "wider margins". These are all very well as a protection against purely temporary disturbances; but in the course of time the currencies would tend to become wedged against their upper or lower limits.

Wider margins would only be the answer if accompanied by small and timely changes in the central parity itself. Under these conditions the market rate would not necessarily have to move after a change of parity; and indeed the official exchange rate policy could then follow longer run market trends. A system of this kind would work in practice very much like one of floating rates; but those who value the assurance provided by a known parity would be comforted; and businessmen could feel confident that there would be no wild fluctuations or large jumps in a short period of time.

A much more immediate issue for the U.K. is the possibility that the EEC might, either at the Finance Ministers' meeting on September 13, or on a later occasion, agree to lock their parities together and float jointly against the dollar. Their failure to do this is far from being the tragedy that it is so widely supposed. The concept of EEC monetary union has always seemed a classic case of putting the currency cart before the political horse. Nevertheless, such a joint move could well be attempted.

In that case Britain's right course seems clear. It is to express support for the move and keep in close touch, but not take part in the period before 1973 when we are not yet members. It was quite impossible to guess even before the present currency storm, the right set of exchange rates at which to join the EEC. It is doubly so today; and it would be embarrassing and difficult to lock ourselves in at one parity relationship, and then try to unlock ourselves if it worked out badly.

By 1973 we will have a better idea of whether the proposed monetary unification is either workable or desirable. If it is, then the U.K. can at some stage join after having had a transitional period of floating in which to discover an appropriate exchange rate for EEC membership. In the meanwhile, sympathetic non-participation seems the right course. It is also the one which the Government will be advised to take by its best qualified advisers.

Labour News

Carr advice on tax misleading says TUC

BY MICHAEL HAND, LABOUR CORRESPONDENT

THE GOVERNMENT is accused by TUC leaders of having given misleading information about the extent to which unions will follow TUC advice not to join the new industrial relations legislation will still be able to get tax relief on their "vident funds".

Regrettable

In its report to next month's annual Congress, published today, the TUC general council regrets that Mr. Robert Carr, secretary for Employment, has stated in the Commons that unions who do not want to register under the legislation will be able to continue to receive industrial relations funds from the Government. The TUC's annual income under the 1965 Industrial Relations Act and the 1966 Friendly Societies Act.

But, the general council reports, it finds after taking legal advice that except possibly in one or two cases this would not provide a satisfactory means for unions of securing tax exemption. "It was clear," says the general council, "that the Government had been giving a misleading account of the position and this was regrettable."

So far, despite pressure by the Opposition, the Government has refused to amend the legislation to deal with this problem "even though it has been pointed out to them in the strongest terms that it is improper that the legislation should, as a by-product, in effect impose a fine of several million pounds on unions for not registering—an action which it is quite lawful for unions to take under the terms of the legislation."

Mrs. Barbara Castle put a figure of up to £5m. on this "fine" when the issue was debated in the Commons recently, and appealed to Mr. Carr to take further advice after he decided that he had misled MPs and said he still believed that there was "no insuperable

obstacle" to the unions in separating off their industrial fund activities. This apparently is the view he still holds to-day. Registration will be a burning issue at the September Congress with at least one union advocating a change in TUC policy from recommending unions not to register to instructing them not to do so under threat of expulsion. This will be strongly resisted by some of those who feel that they may have no alternative but to register to protect their funds.

The rise in U.K. unemployment to more than 900,000 this month will also be a dominant issue at the conference which will have before it the TUC paper to the July-NECD meeting in which the general council said the Government should openly commit itself to a minimum rate of growth of the GDP of 3 per cent. a year from mid-1971 for at least two years.

It said that a measure of the gravity of the problem was that this rate would still at the end of 1973 be likely to leave unemployment above 500,000.

Increase
The general council report confirms that the Congress will be asked to sanction an increase in the annual affiliation fees to the TUC. As reported in the Financial Times last month it would go up to 10p for each member of an affiliated union—an increase of 2p. This will increase revenue by about £200,000 a year, raising the TUC's annual income to around £1m.

The last substantial increase in affiliation fees was in 1967, but the report points out that in every year from 1968 to 1970 expenditure had exceeded income by £175,000. These deficits had been met out of reserves, as bad the cost of about £120,000 of mounting the campaign against the industrial relations legislation.

Triumph, Coventry, back in production to-day

TRIUMPH MOTORS, Coventry, resumes car production to-day after laying off 3,000 men for three days last week because of a work-to-rule by 90 internal transport drivers involved in a manning dispute.

The congestion of cars and materials caused by the drivers' action has been slightly eased during the last three days, but with the dispute continuing there could be more lay-offs this week.

Speke return
Triumph workers at the two factories at Speke, Liverpool, also return to work to-day following a strike over pay by painters since last Tuesday which caused a lay-off eventually involving most of the 2,800 labour force. This cost a daily production loss of 160 Toledo cars, and of Triumph car bodies including the TR6 and the 1500.

The Woodend body plant day staff will not return until to-morrow but to-night's shift will start production. The strike was called off to allow further talks.

Berlin pact: first stage due to-day

BY MALCOLM RUTHERFORD

BONN, August 22

THE first stage of a four-Power agreement on Berlin is confidently expected to be reached to-morrow, though the agreement will then be referred back to Governments for final approval before being signed—probably in about two weeks' time.

The provisional text is regarded with satisfaction by Western diplomats, who note that the Russians have made concessions which scarcely seemed likely only a few months ago.

The concessions are attributed to the departure—almost certainly under Soviet pressure—of the East German leader, Herr Ulbricht, last May, and to further Soviet pressure on his successor, Herr Erich Honecker.

Key role

It is believed the Russians have persuaded the East Germans to accept certain short-term losses in the hope of long-term advantages. Among the latter would be international diplomatic recognition for the East German Republic and its probable admission to the United Nations.

Mr. Gromyko, Soviet Foreign Minister, is thought to have played a key role in convincing the East Germans to make these concessions. He was present in East Berlin last week, during the crucial stage of the four-Power negotiations.

The short-term losses to the East Germans are nevertheless considerable. A claim that West Berlin is a separate political entity, or third German State, appears to have been put into cold storage and the Russians have agreed that many of its strong ties with the Federal Republic can remain in being.

It is understood, for example, that West Berlin interests abroad will be represented by a combination of the three Western Allied Powers and the Government in Bonn.

This is a far cry from the East German and Soviet insistence

Immediate gain

In the short run, the one immediate gain to the Russians is that they will be allowed to establish a consulate-general in the Western sector of the city.

Its staff, however, will be accredited to the three Allied Powers, and not to the West Berlin Senate. On paper, this no more affects the present status of Berlin than the establishment of a Soviet Consulate-General in Hamburg affects the present status of the Federal Republic.

In the longer run, the Russians are entitled to claim that the Western Powers must now move forward towards a European security conference and the Bonn Government towards the ratification of the Bonn-Moscow treaty, signed a year ago.

A satisfactory Berlin settlement was made a pre-condition for both of these moves by the West.

Final 'package'

But there will still be a few months' grace. The signing of a Four-Power agreement must be followed by talks between the two German States on its practical implementation. These are expected to last at least three months. Only then will the four Powers seek to tie up the agreement in a final package to be put to the Bonn Parliament for ratification.

In the process of the inner German talks, however, East Germany is likely to do much to advance its claims to international recognition, and it is acknowledged that the very fact that the talks will take place at all is a claim in itself.

Rebels oust Bolivian President Torres

LA PAZ, August 22

RIGHT-WING army rebels to-day ousted Bolivia's Leftist President Juan Torres after the loyalist Presidential Guard had surrendered in the capital. A Church spokesman said arrangements were being made for President Torres, who had earlier been reported directing resistance by the 1,500 guards of the Presidential Guard, to be conveyed from a hiding place "somewhere in the city" to the Papal Nunciature in a residential suburb.

Last night President Torres fled his palace as rebel tanks closed in. Hospital authorities estimated that at least 80 people had been killed and more than 200 wounded in the fighting.

The city's principal radio station, taken over by rebel supporters, early to-day, announced that Colonel Hugo Banzer, named as leader of a military triumvirate, would broadcast to the nation later.

The radio said Col. Banzer at one time apparently a prisoner of Torres' forces—was with an armoured regiment at Viacha, 12 miles south of the capital. He would travel to the presidential

palace to make his broadcast, the radio added.

Bugh O'Shaughnessy writes: The reported victory of the Right-wing rebels in Bolivia this weekend does nothing to improve the prospects of the tin industry. The consolidation of a conservative regime in La Paz could bring into doubt plans for continuing Soviet aid to and trade with COMIBOL, the State mining complex, and ENAF, the national refinery.

It could also be the signal for continuing labour unrest in the mining areas around Oruro, as the miners are solidly against the Right-wing junta which has seized power.

CUNARD WRIT AGAINST FORMER BOARD MEMBER

BY OUR OWN CORRESPONDENT

THE Board of Cunard Steamship Company is issuing a High Court writ, claiming damages for alleged slander and libel against Mr. Donald Foster.

Mr. Foster resigned earlier this month from the Board in protest against acceptance by most of the Board of the bid for the company by Trafalgar House Investments.

Treason charge in Egypt

BY OUR OWN CORRESPONDENT

CAIRO, August 22

THE alleged attempt, which was first disclosed by President Sadat on May 14, to overthrow the Government, has been charged to-day with high treason, a charge that could lead to a death sentence or hard labour for life.

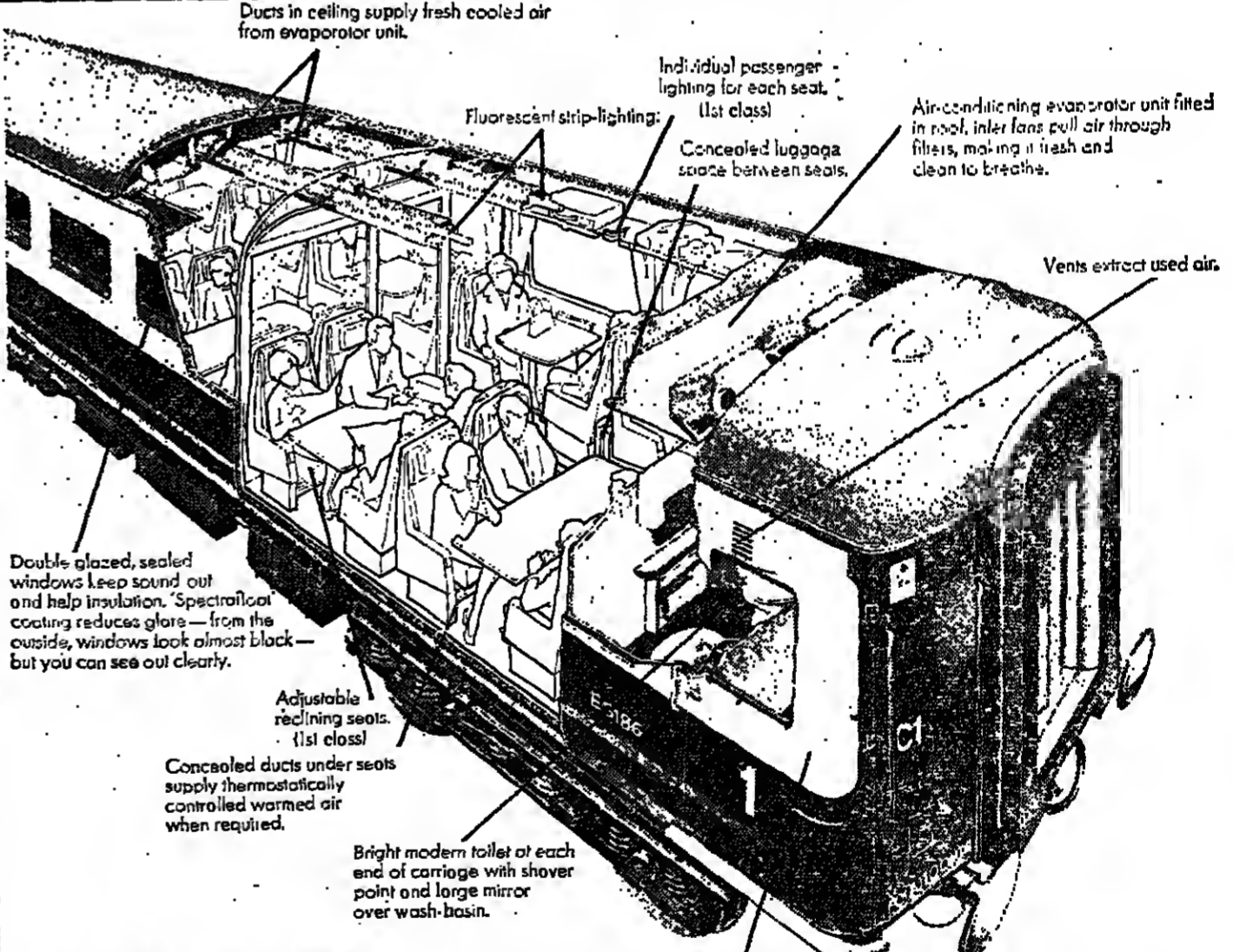
Sabat and 90 other defendants, including seven ex-Ministers and a former Speaker of the National Assembly, were accused of plotting to bring down the Government of President Anwar Sadat.

The 91 defendants will be divided into three groups. Sabat and the former Ministers are in the first group. The second group comprises 18 senior officials, and the third group, 63 defendants, charged with aiding the main conspirators.

The charges came after a three-month investigation into

the alleged attempt, which was first disclosed by President Sadat on May 14.

General Mohamed Fawzy, the former War Minister, will be tried separately by Supreme Court Martial. The indictment claims that Fawzy was to have headed the Presidential Council, planned by the defendants to assume authority.



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Arr. Newark				1420		
Arr. Retford				1430		
Arr. Doncaster				1512		2123
Arr. Wakefield	1014	1348				2149
Arr. Leeds	1034	1408			1830	2211
Arr. Bradford	1109					2248
Arr. Harrogate		1448			1908	
Arr. Hull			1512			
Yorkshire to London	Dep. Hull					1740
Dep. Harrogate						1622
Dep. Bradford						1700
Dep. Leeds		0715	1150			
Dep. Wakefield		0725	1220			
Dep. Doncaster			0747	1237		1716
Dep. Peterborough						1841
Arr. King's Cross	1002	1010	1500	1940		2106

Six Newcastle services are also air-conditioned now. Ten Scottish and ten more East Coast main line services will be introduced later in 1971.

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COMPANY NEWS + COMMENT

Gresham Investment tops profit forecast

AGAINST A forecast of not less than £500,000, Gresham Investment Trust reports a group pre-tax profit of £525,398 for the year to March 31, 1971. This represents an increase of 16 per cent. over the previous year's £452,471.

The final dividend is the forecasted 41 per cent. increasing the total from 61 per cent. to 7 per cent. And the directors forecast maintenance of that rate for the current year on capital to be increased by a one-for-eight scrip issue.

They see no reason why the "steady increase" of profit and dividend should not continue.

No profits or income from sale proceeds are included for two subsidiaries (Cam Profiles and Angula Engineering) sold during the year. Pre-tax profits of £11,440 from these were included in 1970.

Neither does the profit take into account earnings from substantial minorities in unquoted companies. If these had been included the profit, before tax, would have been increased by more than 50 per cent. Also the profit does not include any profit from realisations of investments amounting to £203,607.

As known holders will be asked to approve a share incentive scheme for senior executives. Meeting September 28.

● **comment**
With a 4 1/2p rise in the share price on Friday adding up to two-thirds advance this year, the market seemed to be anticipating a good set of preliminary figures. In the event Gresham Investment has not disappointed with pre-tax profits ahead by 28 per cent. (excluding profits in both years from two subsidiaries sold during 1970-71). This is comfortably above the interim forecast and at the net level a 26 per cent. rise leaves earnings per share at 32p—more than double the 1968-69 figure. What is more the reported total conservatively excludes profits from minority stakes in unquoted companies and capital profits. Overall, though, a p/c of 50.4 looks on the high side but does have some support in an impressive record and an apparently cum-growth future.

HIGHLIGHTS

Key results in a quiet week ahead are coming from Carreras (preliminary figures to-day) and London Brick which is scheduled to report for the half-time on Thursday. Considerable interest should also be generated by the interim figures to-morrow from News International and Rentokil, with Pearl Assurance's similar announcement coming the following day. Mather and Platt and Nu-Swift Industries are also due to make half-time statements on Thursday and Friday respectively.

Cooper Industries confident

CHAIRMAN of Cooper Industries Mr. C. Cooper tells members that "prospects have never been better than they are to-day."

Liquidity is at an all-time high and long-term expansion plans are laid. He is confident he will be reporting results that break further records this time next year.

As reported July 22, group profits, before tax, for the year ended April 30, 1971, improved from £617,364 to £767,614 and the dividend is raised to 15 per cent. (12 per cent.).

An analysis of turnover and profit shows steel re-rolling and engineering constituted 53 per cent. and £556,790; building and joinery 15 per cent. and £211,824. The former is after non-recurring charges totalling £80,000 in respect of exceptional bad debts, irrecoverable excess costs on imported materials and stock write-off; the latter includes £158,000 profit on the sale of land.

At April 30, 1971, the chairman held 4,233,041 Ordinary shares of 10p each. The highest paid director received £23,669 (£21,002). Meeting, Dudley, Worcs., September 15, at noon.

● **comment**
On the face of it, Cooper Industries' second-half profits showed growth of 28 per cent. compared with 19.3 per cent. in the first six months. But this is opening up the report reveals that last year's figures were enhanced by profit on sale of land, and therefore the true earnings advance is from 2.35p in 1969-70

to 2.44p. Furthermore, pre-tax margins (on the same basis) effectively declined by upwards of 14 points to 7.7 per cent. over the 12 months. The shares have appreciated from 24p since the preliminary figures to a 1971 peak of 27p, where the p/c of 11 still gives little credit to the fact that earnings have increased by over 50 per cent. in two years.

Further new Wolf Sapphire products were successfully introduced during the half year including two portable circular saws.

Profit for the full year 1970 expanded from £277,007 to £299,398, and the dividend was lifted from 15 to 17 1/2 per cent.

Further new Wolf Sapphire products were successfully introduced during the half year including two portable circular saws.

While sales growth is necessary simply to absorb the effect of rising costs, the chairman of Melias, Mr. J. C. Sanderson, says the outlook for growth in profits in the current year "appears to be very promising."

Sales are currently running about 25 per cent. above the level for the same previous period.

The Board is confident that the benefit of the substantial and continuing capital expenditure programme will for the first time be felt to a "significant extent" in the current year.

As reported on July 22, group pre-tax profits for the 53 weeks to April 3, 1971, were £110,000 (£113,000 previous year) and the dividend is 6 per cent. The last payment was 7 1/2 per cent. in 1963-64.

The chairman says during the year 12 new stores were acquired and nine declining branches were closed. At the year end there were 101 trading branches. Among the openings were five self service stores in the Wolverhampton area, acquired in late October on "most advantageous" terms.

All these new stores are trading profitably and full benefit will only be felt in the current year. Four new stores have opened so far this year, and there are now firm plans for a further six.

Melias is a subsidiary of AB Foods. Meeting, Connaught Rooms, W.C., September 15, noon.

● **comment**
After a forecast of maintained or possibly improved 1971 results "a 36 per cent. increase in Wolf Electric's half-year pre-tax profits is reassuring. The market does, however, seem to have been anticipating something along these lines as the shares have risen 23p to 90p since the forecast in mid-April. In 1970 the main push (in turnover terms) appears to have come from the 40 per cent. increase in exports and this side's contribution (about a quarter of group sales) clearly provides a buffer against any difficulties in the U.K.

What the "satisfactory" second-half prospects means is anyone's guess at present; on earnings of about 10p for the last 12 months the p/c is still only 9 despite the recent share price strength. But given the dull industry background and the 1969 upset, this rating is perhaps understandable.

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Edbro progress in Europe

UNTIL there is an overall expansion in public works and other construction projects, with some promise of continuity, the demand for the main product of Edbro (Holdings) — hydraulic tipping gears — will continue to be depressed, says chairman, Lord Coleraine.

Before the end of the current year, however, there should be some benefit from the £100m. public works programme announced last month, he adds.

Lord Coleraine reports that the European marketing company continues to make "excellent progress" and in the event of entry into the Common Market "your company should be well placed to take advantage of the new situation."

Export figures show that the company is competitive in present conditions "and we may reasonably hope that after we have joined the Community the rate of export will increase even more rapidly."

In the year to March 31, 1971, direct exports increased to a record of over £2m. As reported on July 24 group pre-tax profit was £297,085 (£245,186) and the dividend 22 1/2 (21 1/2) per cent.

Lord Coleraine has decided to retire from the chair. It is intended to invite Mr. L. V. D. Tindall, who joined the Board during the year, to succeed him.

Meeting, Charing Cross Hotel, W.C., September 17, noon.

● **comment**
The current year for William Jackson and Son will be one of consolidation, and profit is expected to be similar to that shown for 1970-71, chairman, Mr. P. B. Ougbourn, tells members.

As reported on August 10, group profit, before tax, for the year ended April 24, 1971 improved from £724,190 to a record £878,040 and the dividend is lifted 1 1/2 per cent. to 8 1/2 per cent.

At the time of the Pennine Trading Estate was professionally valued at £5,251,650 and the directors consider that in view of its substantial development, Comley and Pitt should be operated as a separate entity within the group and that the existing stock should be exchanged for a stock issued by Comley and Pitt secured solely and directly on the estate.

Profit before interest on the parent company loan and tax of Comley and Pitt for the year ended March 31, 1971 was £275,322 for 1971-72, expected to be not less than £225,000.

● **comment**
The following securities have been added to the Share Information Service appearing in the Financial Times.

The Investment Company (Section: Property) (Section: Engineering and Metal) (Section: Schieffelin Insurance and Institutional Holdings (Section: Trusts, Finance, Land, etc.) (Section: Berwick Timpe (Section: Industrial Risk, Misc.) (Section: Llanerth Kilgobry Group (Section: Drapery and Stores) (Section: Halcyon Investments (Section: Tees Ceylon) (Section: Glendevon Investment Trust Ordinary and "B" Shares (Section: Investment Trusts).

● **comment**
Commenting on prospects of Craigielea's Rubber Plantations chairman Mr. A. W. Scott says it is too early to assess those of rubber for the current year.

The market is still at a low level but the output is ahead of last year which at that time included Johore River, and the company continues to obtain excellent premiums "for pale crepe."

As to palm oil, however, he says, prospects are good. Output for the first four months was double last year and the final crop should be at least 50 per cent. higher. The present price, £115 per ton, compares with last year's average of £104.

A more significant factor is the income from investments in rubber companies. This year, for the first time, dividends will be received from Straits Rubber shares of not less than £65,000—the equivalent of a Craigielea dividend of 7 1/2 per cent.

As reported on August 7 profit, before tax, for the year to March 31, 1971 was £203,738 (£283,106) and the dividend 11 per cent. (10 1/2) per cent.

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DIVIDENDS ANNOUNCED

Current payment % Date of payment % Carrying payment % Total last year % Total this year %

Gresham Invest Trust 44 Sept 29 34 17 61 61

Press Tools 10 10 61 61

Wolverhampton Racecourse 61 61 61 61

continuous pressure of rising costs on margins causes concern.

The bakeries have shown a much improved profit as the sales organisation obtained more orders which increased output to such an extent that plants have been working to capacity to meet the demands. Expansion of activities at Cottingham, meat factory continued.

Turnover from stores continued to expand and two new branches were opened with extensions to modernisation of some existing shops. Since the period end 31.3.71 has been opened and it is expected that a further four will be trading before the end of the current period.

Meeting, Hull, September 13, at 11 a.m.

1% more by Press Tools

FROM INCREASED pre-tax profit of £117,840, against £101,383, Press Tools is lifting its dividend from 14 1/2 per cent. to 15 1/2 per cent. on April 30, 1971, with a final of 10 1/2 per cent. against 10 per cent.

When reporting first-half profit up from £51,300 to £60,200, and an increase in interest of 64 per cent., the directors said they hoped to raise the final.

The year's profit is subject to slightly lower tax of £38,998 (£45,254).

Lunt Comley Deb. plan details

Documents have now been sent out to holders of the £1.5m. 7 1/2 per cent. Debenture stock of Lunt Comley and Pitt setting out the details of the proposed consolidation, and profit is expected to be similar to that shown for 1970-71, chairman, Mr. P. B. Ougbourn, tells members.

As reported on August 10, group profit, before tax, for the year ended April 24, 1971 improved from £724,190 to a record £878,040 and the dividend is lifted 1 1/2 per cent. to 8 1/2 per cent.

Wm. Jackson consolidation

The current year for William Jackson and Son will be one of consolidation, and profit is expected to be similar to that shown for 1970-71, chairman, Mr. P. B. Ougbourn, tells members.

As reported on August 10, group profit, before tax, for the year ended April 24, 1971 improved from £724,190 to a record £878,040 and the dividend is lifted 1 1/2 per cent. to 8 1/2 per cent.

At the time of the Pennine Trading Estate was professionally valued at £5,251,650 and the directors consider that in view of its substantial development, Comley and Pitt should be operated as a separate entity within the group and that the existing stock should be exchanged for a stock issued by Comley and Pitt secured solely and directly on the estate.

Profit before interest on the parent company loan and tax of Comley and Pitt for the year ended March 31, 1971 was £275,322 for 1971-72, expected to be not less than £225,000.

FT Share Information Service

The following securities have been added to the Share Information Service appearing in the Financial Times.

The Investment Company (Section: Property) (Section: Engineering and Metal) (Section: Schieffelin Insurance and Institutional Holdings (Section: Trusts, Finance, Land, etc.) (Section: Berwick Timpe (Section: Industrial Risk, Misc.) (Section: Llanerth Kilgobry Group (Section: Drapery and Stores) (Section: Halcyon Investments (Section: Tees Ceylon) (Section: Glendevon Investment Trust Ordinary and "B" Shares (Section: Investment Trusts).

Craigielea's prospects

Commenting on prospects of Craigielea's Rubber Plantations chairman Mr. A. W. Scott says it is too early to assess those of rubber for the current year.

The market is still at a low level but the output is ahead of last year which at that time included Johore River, and the company continues to obtain excellent premiums "for pale crepe."

As to palm oil, however, he says, prospects are good. Output for the first four months was double last year and the final crop should be at least 50 per cent. higher. The present price, £115 per ton, compares with last year's average of £104.

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MINING NOTEBOOK

Where you just can't trust anybody

BY LODESTAR

IT IS just impossible to rease writing about Australia the place where is never seems to stop happening. And what is happening there is daily appearing to be good. Nor, come to that has there been much joy from other parts of the mining world what with South African gold and uranium producer Bushveldt's production surely to goodness be based on firm evidence in the light of the Nababek affair, caused no surprise forward in the market. In fact last week they fell a further 35p to a 1971 low of 355p, making a drop of 70p over the past fortnight. This was in line with the generally weak stock market in South Africa, and the wide range of

cock of his right to establish before the law any rights he may have." Hancock himself called the measure "a short sort of dictatorship and, in the opinion of our man on the spot in Perth, public outcry against "bush-ranger" government principles is likely to follow. Hancock will undoubtedly have received another swinging blow.

in its dividend and Corn
producer Geever turning

In Australia at the moment it seems that you just can't trust anyone. Even the assessment here last Monday of Gold Mines of Kalgoorlie as having reasonable chances as a speculation on the gold market, and the deal something of a body blow by all people the Australian Commissioner of Taxes who withdrew the written fiscal advice that he had previously given that the company was sound in which his whole newly-planned future had presumably been based.

Expected refection in the share price of the company in the year to June 30.

In the event, the drop from \$9.9m. to \$6.8m. (£3.3m.) was actually rather less than had been anticipated. It could be that the management showed its confidence in the future by actually increasing the dividend modestly by 1 cent to 15 cents (1p). How expansion of the company's operations was judged from the fact that the total expenditure on new projects is estimated that no less than \$20m. (£3.3m.) did not contribute

Finally, we come to the auditors' unprecedented qualification of the accounts of Australia's biggest company, Broken Hill Proprietary. In their opinion, the company's assets or liabilities should have been made in respect of the mining subsidiaries as well as the \$20m. that had actually been put aside for the Hematite project. This was a serious matter. Such extra provision would have reduced the RUP profit of \$68.3m. to equal to \$31.9m. and the highest ever earned by an Australian company.

THE COMPANY'S ACCOUNTS IN A

Peko's confidence

GMR shares, which had gone up from 200 to 225, fell back to 210, but did not yet lose. The company is not prepared to give up a tax battle which it obviously has lost. But further negotiations with the commissioner will obviously take time.

Peko already has a large area for three with faith both in Australia and in the eventual resumption of growth in the demand for minerals.

have little option but to
their fingers crossed.

case, as our Mining Editor commented, at least the directors can hardly be blamed for misleading them.

This brings us round again to the extraordinary case of the misappropriation of its Nabarlek uranium fund, a subject discussed here last Monday.

Circumstances doubtless were bound to be cast on the "guesstimate" of 70,000 tons of uranium oxide held by the company, and the chairman Mr. John Proud for the Ranger 1 deposit, also in the north-west, was not alone in being deceived.

So far we have dealt with blows to confidence in the Australian mining scene by management misdeeds, the tax authorities' decision to swipe, however, comes from a State Government, that of Western Australia in fact, and the Government of New South Wales carried the heading "Hawwright may have won its case on appeal but has lost the Government's decision to approve the right of millionaire uranium prospectors Hancock and Wright to the rich Mt. Lindsay Ridge, McCreamey's Monster and

benefits are being raped.

Scrap issue

The auditors' qualification actually had an adverse effect on the share price, but it was still valued another blow to market sentiment as a whole. On this side of the ledger, however, the BHP dropped to 367, with an increase of 100 shares to 100,000,000, and the enormous swing in capital value in the light of the

hardly be blamed for mis-
them

This brings us round again to the extraordinary case of Queensland Mines' sharp downgrading of the value of the iron ore subject discussed here last Monday. I said then that in the circumstances doubts were bound to be cast on the estimation of 70,000 tons of uranium oxide made by Peko-Wallaseid's chairman Mr. John Proud for the iron ore which was found in the Northern Territory, discovered in partnership with EZ Industries.

But Mr. Proud is unabashed. He now says that follow-up diamond drilling and a further reassessment of all available information from the No. 1 anomaly indicating that it contained approximately 30,000 metric tons of uranium oxide, the ore grade being put at 7 lbs a ton. From the original pre-prospecting drilling it is still reckoned that there is a minimum of 30,000 metric tons, and it is possible 31,000 metric tons. So, it is pointed out, the latest assessment is actually slightly better than the original estimate.

This re-estimation, which must be the work of the Government and the tax authorities, is the first time that a company comes from a State Government, that of Western Australia in fact, last Thursday our Mining Minister, Mr. John McEwen, said: "Hunwrigt may have won its iron ore battle." It was based on the Government's decision to increase the capital of the iron ore prospectors Hancock and Vrich to occupy the Rhodes Ridge, McCarney's Monaster and the Ironbark area. The decision, thus was claimed as giving the 20-head for the Innit awaited Hancock Minerals flotation in the iron ore field. The Ironbark Holdings, Texas Gulf Sulphur and the Consolidated Gold Fields group are involved.

Then, it almost overnight the value of the iron ore was put into sharp reverse by the State Government. There is no space here to go into all the ins and outs of what is a most complicated case, but I have summed up in a comment, deploying the Government move, by Peter Behnsen, Law Society Secretary, that the Government's Parliament is depriving Mr. Hancock of the right to sell his iron ore at a profit. The auditors' qualification actually had an adverse effect on not only BHP shares but it produced a general loss of confidence in the sentiment as a whole. On this side of the world this seems rather nonsensical. Nevertheless, the iron ore is worth \$100 a ton in the interim they have been as high as \$200, an enormous swing in value. The value of the iron ore is \$14.7 million shares in issue.

On Friday BHP announced that a debenture issue of unspecified amount is planned. The debenture is also a 10-year scrip issue, a fact that once more is a surprise to the Sydney market up a little.

Like Peko, BHP's share price has been dropping for some time for the fact that an air of uncertainty continues in hang over the iron and steel segment of the iron ore group's business.

There is still a reasonable chance, despite the persistent presence of the rising cost of steel, which haunts the iron ore industry, that the iron ore will sell at a profit with fresh records in 1973.

ROY BLUMENTHAL

IN MERGER

Roy Blumenthal Associates and Hardware Consultants have merged. Future trading will be under the name of Roy Blumenthal Associates from that company's offices at 10, South Molton Street, London, W1 (Tel. 1-499 3637). Mr. Keith Naylor, managing director of Hardware Consultants, joins as director, and his staff have joined the merged organisation.

Mr. Pat Ridson, managing director of Roy Blumenthal Associates, said: "We have been increasingly involved in the hardware industry over the past four years. The merger of the two resources will enable an accelerated expansion programme of services."

his staff have all joined the
 merged organization.

BY REDHEUGH
Redbeugh Iron and Steel Co. of
Fearn, Gateshead, have for the
first time in their history pro-
duced a single steel plate above
half a ton in weight. The plate
weighs 1,320 lbs and measures
8 feet x 4 feet x 1 inch thick.

National Savings rise goes on

BY OUR OWN CORRESPONDENT

NATIONAL Savings movement continued to attract investment at a relatively fast pace in July, according to preliminary figures for the month, which show savings of £31.3m, against net withdrawals of £10.6m. In July last

With the inflow, the movement of savings of \$164m. in the first four months of the financial year, whereas in the similar period of 1970-71, redisturb were less than \$100m. Even over the year, there was a surplus of \$2.2m. In July Jagan set withdrawal of \$25.2m. a year earlier, of a four-month surplus of \$25.2m. (Jagat set a shortfall of \$1.1m.).

The surplus last month was lost in spite of holiday withdrawals from the savings banks, and a record of \$100m. net with a net account into their personal accounts

party to be registered to-morrow as the United Progressive Party.

The new party is to enter into talks with the executive of the present official Opposition, African National Congress.

Mr. Kapwepwe attacked the Government as being corrupt, indisciplined and ineffective and demanded fresh mandate from the people in the form of dissolved and fresh national elections held, and such a step can be forced by dissident MPs once Parliament reassembles in November. Mr. Kapwepwe called for a change in leadership which must follow the political independence achieved seven years ago.

But yesterday the tall, bearded Mr. Kapwepwe called on Dr. Kaunda as leader of the new party his boyhood friend President Kaunda with perhaps the gravest challenge of his seven-year rule.

Only last Monday Dr. Kaunda, who has held the reins of independence, dismissed the UPP—the formation of which has been known since July—as “the work of a few dissidents and malcontent men.”

But yesterday the tall, bearded Mr. Kapwepwe called on Dr.

July, as in the first thr

	April-July 1967		Apr.-July 1968	
	R'p'as	Re- pay- ment	R'p'as	Re- pay- ment
to as You	£m.	£m.	£m.	£m.
to Mr. Nkomo	0.8	0.2	4.7	—
" " S.D.A."	0.9	0.1	1.2	—
" " S.D.A."	5.6	4.0	7.2	—

Sav. B'nda	29.6	13.4	27.0	10
ence B'nda	—	7.3*	—	17

[illegible]

Time for reflection

BY OUR INSURANCE CORRESPONDENT

INTERNATIONAL financial policyholders participate in equity and property investments through their chosen insurers' life funds? So it will be an interesting see and hear if so, where, the committee will set its own boundaries, short of a full-scale examination.

As time goes by, more and more do the differences between many of the traditional with-profits contracts and their various linked cousins diminish. Remembering Kipling, it is fair to say that the layman is as dead as the lion and the armadillo no longer identifiable as either bedbeag or tortoise. This being so, from the public, as well as

the life assurance article in last Monday's Financial Times surmises on insurance and the Common Market. Markets in the United Kingdom and in France in particular, life insurance companies are subject to very detailed Governmental control, particularly in the investment field. Although in the long term the insurance regulations of the enlarged Community will have to be harmonised, from its terms of reference the committee should not look too anxiously across the Channel, but should make recommendations within the existing framework of British law and with specific

It was in the spring that the Scott Committee was set up, with

the following terms of reference: "To consider the working of the Insurance Companies Act, 1938-1967 and of the Prevention of Fraud (Investments) Act, 1958 insofar as that latter is relevant to the light of life assurance schemes involving the issue of equity linked policies, unit linked policies, property bonds and similar schemes and to advise on the adequacy of the protection afforded by these Acts to policyholders in these schemes."

Undoubtedly a wide ranging brief—but where precisely do the committee's duties terminate? "Similar" to "such schemes" if not the traditional "with-profits" endowment and whole of life contracts where

to any particular category or life assurance contract?

Future buyers

Though the word "policyholder" appears in the terms of reference, it is clear that the committee would be taking all too narrow a view of its obligations if it ignored the prospective policyholder—the person who has not bought, but has still to be induced by advertisement or doorstep salesman. Indeed, this was undoubtedly an area of inquiry well in mind when the committee was set up.

Since the spring, the possibility of British entry into the Common Market has become not just a probability, but a near certainty. As was explained in

the committee would not propose detailed regulations on the way in which policies are sold, on company expenses, on types of investment and methods of valuation, or on rules of conduct for the establishment of standards of disclosure adequate to show both the nature and quality of the contract and the integrity and financial viability of the company offering. This, coupled with statutory "cooling off" period to replace the existing contractual laws as to misrepresentation and mistake, would provide a clear and surely more satisfactory alternative to the present rules of sale of insurance. EEC members when they come to argue about harmonisation.

Food for thought

Food for thought

on tanker chartering

BY JAMES McDONALD, SHIPPING CORRESPONDENT

THE oil tanker charter market last week—apart from such continuing problems as relet tonnage from major oil companies depressing rates—was overshadowed by an outside influence—the world currency situation. There has been talk with perhaps some understatement, that it has given both charterers and owners "considerable food for thought," especially as the immediate effect on trading patterns and secondarily as to the safeguarding of payments under charters being negotiated.

Jacobs and Co., in its weekly report, says that rates—and they have also risen from the Mediterranean to the U.S. Atlantic coast. "Lambert Brothers comments: 'It is interesting to note that this development corresponds with an increase of crude oil through Tappin; the flow had recently fallen to approximately half Tappin's \$80,000 barrels per day maximum.'"

From the Caribbeans to USAC rates closed the week at \$26.95 a tonne, a slight drop lower level than a week before. Rates from the Caribbeans to U.K. or Continent were stated at the end of the week to be about Worldwide

Sales

At the top sales held in London last week 26,856 tonnes sold realised an average price of £12.99 per ton against £12.90 at the previous week. The average price. Plain tea was quoted at £17.00 per ton, black tea at £15.00 per ton.

	per ton	per cwt
African Highland Prod.	£7.71	36p
Arabia-Ceylon and Gen.	28.29	27
Bamboo	25.57	42p
Cashew Nuts	25.57	42p
China Tea	25.57	42p
India Tea	25.57	42p
Java Tea	25.57	42p
Malay Peninsula	25.57	42p
Porto Rico Plants	25.57	42p
Rubber	25.57	42p
Siam	25.57	42p
Sri Lanka	25.57	42p
Taiwan	25.57	42p
Dumbla Valley	4.44	47p
Himalayas	12.52	47p
Kashmir	12.52	47p
Nepal	12.52	47p
Pakistan	12.52	47p
Sri Lanka	12.52	47p
Taiwan	12.52	47p
Yunnan	12.52	47p
Zanzibar	12.52	47p
Algeria	12.52	47p
Libya	12.52	47p
Morocco	12.52	47p
Tunisia	12.52	47p
Malagasy	12.52	47p
Madagascar	12.52	47p
Mayotte	12.52	47p
Reunion	12.52	47p
Comoros	12.52	47p
Seychelles	12.52	47p
Chagos	12.52	47p
Christmas	12.52	47p
Falkland	12.52	47p
Gibraltar	12.52	47p
Guernsey	12.52	47p
Jersey	12.52	47p
Manx	12.52	47p
Norfolk	12.52	47p
Orkney	12.52	47p
Shetland	12.52	47p
Trinidad	12.52	47p
Tobago	12.52	47p
Venezuela	12.52	47p
British Virgin Islands	12.52	47p
Cayman Islands	12.52	47p
Faroe Islands	12.52	47p
Fiji	12.52	47p
French Polynesia	12.52	47p
Greenland	12.52	47p
Heard Island	12.52	47p
Howland	12.52	47p
Jan Mayen	12.52	47p
Kingman Reef	12.52	47p
Laysan	12.52	47p
Midway	12.52	47p
Nassau	12.52	47p
Norfolk Island	12.52	47p
Oahu	12.52	47p
Pago Pago	12.52	47p
Pitcairn	12.52	47p
Samoa	12.52	47p
Tahiti	12.52	47p
Tonga	12.52	47p
Tuvalu	12.52	47p
Wallis and Futuna	12.52	47p
Western Samoa	12.52	47p
Yemen	12.52	47p
Zanzibar	12.52	47p

Oil tanker chartering

[illegible]

GRAIN BUYING

single voyage dirty rates last week from the Persian Gulf to Europe remained unchanged, in fairly inactive market, that about Worldscale 574—about Mediterranean to the U.K. or Continent the rate closed the week at Worldscale 764—about 5 points higher over the week

are not particularly profitable at the moment. At August 15 there were 23 tankers of 433,305 dead-weight tons carrying grain nor were there 10 tankers of 487,000 tons at the end of July. Of this latest total, 13 tankers of just over 448,000 tons were under the U.S. flag.

GRAIN BUYING FORMED

S. S. Gravel Ltd., chairman of the Grain Growers' Association, Sir Rudy Stjernberg, vice president, formed to continue buying grain direct from farmers and deliver to consumers following the decision of the U.S. House of Representatives to increase farm income by discontinuing its export trade of buying grain.

EQUITIES

Unit Price	Date	Unit Price	1971		Stock	Unit Price	+ -	Div. & Amos.	Shares	Total	Y/B	Ratio
			High	Low								
76	F.P.P.	3/8	82	75 1/2	Allied Polyester	72 1/2	-1 1/2	618	1.8	6.0	13.1	
77	F.P.P.	1/8	163	40	British & Can. Inv.	43	+ 3	9	1.8	2.0	11.5	
78	F.P.P.	11/16	48	40	Canadian Sec. Inv.	49	+ 11/16	112 1/2	8.8	3.7	12.5	
79	F.P.P.	3/8	107	60	Commodity Sec.	87 1/2	+	112 1/2	8.8	3.7	12.5	
80	F.P.P.	1/16	41	83	Crown	40	-	115	4.4	3.6	20.0	
81	F.P.P.	1/16	18	50	Crown	18	-	115	4.4	3.6	20.0	
82	F.P.P.	1/16	18	52	Formulator 101	56	+ 3/2	657 1/2	7.0	3.3	16.5	
83	F.P.P.	3/8	124	112	Kesterung 101	101	-	655	1.5	3.6	9.9	
84	F.P.P.	1/16	18	50	Meridian 101	50	-	655	1.5	3.3	16.5	
85	F.P.P.	1/16	18	240	Mathews 11 Right 101	240	+ 1	640	1.5	3.3	16.5	
86	F.P.P.	1/16	18	72	Muehlow 1 A 2 101	72	-	640	1.5	3.3	16.5	
87	F.P.P.	1/16	18	72	S&S Newsprint 101	80	8	625 1/2	2.8	3.8	16.9	
88	F.P.P.	1/16	18	86	Therac. Inv. 501	86	-	625 1/2	2.8	3.8	16.9	
89	F.P.P.	3/8	241 1/2	324 1/2	Unit. 101	240	-	625 1/2	2.8	3.8	16.9	
90	F.P.P.	3/8	18	18 1/2	Wright-Scrutton 101	18 1/2	-	612	1.5	3.0	7.4	

FIXED INTEREST STOCKS

[illegible]

"RIGHTS" OFFERS

Date	Ticker	Stock	Closing Price ^a	% of
2/28/79	NH	Alcoa Stock	15pcn	
2/28/79	NH	Borg-Warner Mines	94 + 1	
2/28/79	F.P.	Bovhy	106 + 1	
2/28/79	NH	Chas. & Co.	106 + 1	
2/28/79	NH	Linn. & Assoc.	1pcn	
2/28/79	NH	Sheepbridge King	60pm - 1	
2/28/79	F.P.	Wheeler-Hughes	132 - 1	
2/28/79	NH	Vought-Carter	50m + 1	

covered by reserves and period of reasonable probability is required to place advances on second basis. Meeting at Syward Street, E.C., September 16 at 11.30 a.m.

UNITED KINGDOM AND OVERSEAS INVESTMENT-Interim dividend 4 per cent. (same), total 15 per cent. for 1977. Gross income half year to June 30, 1977, £10,000,000. Net profit after expenses, etc. of £24,650,000. Dividend for half-year is £124,500; shares for half-year are not significantly comparable because of variation in number of shares outstanding.

WILLIAMS FURNITURE-Results for year to March 27, 1977, and chairman's comments reported July 27. Gross fixed assets £1,235,500. Current assets £2,625m, (£235,500), and liabilities £1,650m, (£75,000), plus bank advances and loans £1,235,500. Total assets £2,625,000. Chairman John James Bank, Meeting, 117, King Street, Battersea, March 27, 1977, at 11 a.m.

INTERNATIONAL COMPANY NEWS OVERSEAS MARKETS

Euro \$ bonds retreat from the brink of collapse

BY WILLIAM LOW

IN THE SPACE of just one week, the Eurobond market, like much else in the financial world, has been turned upside down by President Nixon's salvage operation on the dollar.

From being on the brink of what many bankers considered to be total collapse, the Eurodollar bond market has recovered to the point where some operators are confidently talking in terms of a record flow of new issues to satisfy the renewed appetite of investors.

Unfortunately, as is often the case in the volatile Eurobond market, this prediction is somewhat premature.

The truth is that the Nixon bombshell is just the first of a series of moves towards effecting a radical change in the international monetary system: since the subsequent steps remain to be taken, no one can be sure what state the market will be in this time next week, let alone next month.

The immediate reaction of the market to President Nixon's measures was to mark-up prices of straight-debt dollar bonds and convertibles issued by U.S. corporations.

Japanese convertibles, in contrast, lost as much as 10 per cent of their value in reaction to the spectacular decline of the Tokyo Stock Exchange.

However, towards the end of the week, when the expected revaluation of currencies like the Yen failed to materialise, selling—especially from Switzerland—brought down prices from their peaks, while Japanese bonds recovered slightly.

Wise, no borrower has tried to float a dollar denominated loan, although General Motors and TRW might wish that they had delayed their offerings by a few days.

Until the situation becomes clearer, very few dollar issues are likely to come to the market. Looking ahead, prospects for borrowers of long-term dollars are fairly bright.

The expected return of \$10,000, or more to the Eurodollar market will (or should) produce a sharp decline in interest rates, and a return to coupons of 8 per cent, or even less for top quality borrowers is not an unreasonable supposition.

Cash-hungry American corporations should also benefit from rising Wall Street as they wait to issue equity-linked loans. It is more difficult to predict with any degree of certainty what the future will be for Eurobonds denominated in currencies other than the dollar.

Perhaps the greatest question mark surrounds the European Unit of Account (E.U.A.). Much of the recent popularity of the E.U.A. formula has been based upon currency unrest. If this is removed, then the E.U.A. could suffer.

I intend to deal with this particular point in a later article.

Indices

NEW YORK

DOW JONES AVERAGES

Close	High	Low	Open	Prev. Close
20.50	22.50	20.00	21.00	21.00
10.00	11.00	9.00	10.00	10.00
5.00	6.00	4.00	5.00	5.00
2.50	3.00	2.00	2.50	2.50
1.25	1.50	1.00	1.25	1.25
0.62	0.75	0.50	0.62	0.62
0.31	0.37	0.25	0.31	0.31
0.16	0.19	0.12	0.16	0.16
0.08	0.10	0.06	0.08	0.08
0.04	0.05	0.03	0.04	0.04
0.02	0.03	0.01	0.02	0.02

STOCK AND BOND YIELDS

Instrument	Yield
10% Treasury Note	10.00%
15% Corporate Bond	15.00%
30% Municipal Bond	30.00%
45% Commercial Paper	45.00%

IND. DIVIDEND YIELD

Industry	Yield
Automotive	10.00%
Chemical	12.00%
Food	15.00%
Textile	18.00%

N.Y. SE ALL COMMON INDEX

Index	Value
NYSE Composite	20.50
NYSE Industrial	10.00
NYSE Retail	5.00
NYSE Utility	2.50

RISES AND FALLS

Stock	Change
IBM	+0.125
General Motors	+0.062
Wells Fargo	+0.031
AT&T	+0.016

AMERICAN SAIR STOCKS

Stock	Price
Boeing	100.00
Lockheed	80.00
McDonnell Douglas	60.00
Northrop	40.00

INDUSTRIALS, ETC.

Stock	Price
Alcoa	15.00
Aluminum Co. of America	12.00
Armco	10.00
Chrysler	8.00

RAILROADS

Stock	Price
AT&T	100.00
Western Union	80.00
Telegraph & Telephone	60.00
International Telephone	40.00

RAILROADS

Stock	Price
Union Pacific	100.00
Rockefeller	80.00
Standard Oil	60.00
Amoco	40.00

INDUSTRIALS, ETC.

Stock	Price
General Motors	100.00
Ford	80.00
Chrysler	60.00
Stellantis	40.00

RAILROADS

Stock	Price
AT&T	100.00
Western Union	80.00
Telegraph & Telephone	60.00
International Telephone	40.00

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ELECTROLUX EXPORT SALES HIT 71%

By John Walker

STOCKHOLM, August 22.

ELECTROLUX group sales for the first six months of this year are up 10 per cent to a total of Kr1,000m, against the same period in 1970. Sales outside Sweden represented 71 per cent of the total turnover, compared with 68 per cent during the first half of last year. It should be possible, the company states, to increase group profit for the whole of 1971 by 10 per cent as compared with 1970.

Exports—mainly in the form of deliveries from the parent company to subsidiaries—increased to Kr200m, as against Kr174m during the first half of 1970, showing an increase of 15 per cent. Meanwhile, the Swedish market has continued to weaken and the situation has brought about a stagnation in total sales on the Swedish market.

IN BRIEF

JEFFREY MANUFACTURING CO. OF CANADA has won a \$450,000 contract for design, manufacture, installation and commissioning of coal feed and ash and dust disposal systems at R.M. power station near Gaborone in north-eastern Botswana. Jeffrey Manufacturing will work in co-operation with Jeffrey Manufacturing Corporation (Pty) Ltd., Gaborone, Botswana.

ALCAN AUSTRALIA announced that it has returned to profitability and that its smelter at Kurri Kurri is now producing 100,000 tons of aluminium in July.

The company reported a consolidated net profit of \$455,303 for the six months to June 30, compared with a loss of \$1,182,122 for the same period in 1970. The loss for the full year of 1970 was \$4.13m.

COMALCO announced net profit for first six months of 1971 of \$47m, a rise of about 15 per cent on 1970. However, directors warn, trading results for the first six months are now a reliable indication of results for the whole year. An interim dividend of 10 per cent has been declared. The report notes that alumina sales to Australian and overseas refineries showed a steady increase through the domestic market for alumina, 1971 primary and semi-fabricated forms has not, in recent months, maintained its expected long term rate of growth. Increased sales have been made overseas.

TOA NIPPON, General Sekiya and Kyushu Petroleum, announced a contract to export 2.5m-cere oil concession area in Southern Sumatra with P.T. Sinarua Indonesia. The contract is for a period of 20 years, with an option to extend for a further 20 years. The contract also includes a provision for the development of the area.

HINDUSTAN FERRODO, a subsidiary of Turner and Newall in India, has had a successful trading year, recording profits since its formation in 1964. Profits before tax were Rs.1,46,30,000 (Rs.13,00,000) for year ended March 31, 1971, increase of 10 per cent on Rs.1,32,00,000 (Rs.12,00,000) for year ended March 31, 1970. Profits after tax were Rs.1,12,00,000 (Rs.10,00,000) for year ended March 31, 1971, increase of 12 per cent, making total dividend of 23 per cent (22 per cent) for 1970.

MADRID STOCK EXCHANGE PRICES

Name of stock	High	Low	Close	Week's Change	Div.	Net
Aitor Hormos de Vizcaya	96	94	94.5	+1.5	50.00	5.20
Banco Central	967	961	967	+6	11.97	1.23
Banco de Bilbao	872	861	867	+11	13.23	1.61
Banco de Seguros	806	790	790	-16	14.22	1.80
Banco Esp. de Credito	750	736	736	-14	11.33	1.53
Banco Exterior de Esp.	382	381	381	-1	9.35	2.61
Banco Hispano Americano	745	738	738	-7	12.01	1.62
Auxiliar de Ferrocarriles	122	120.50	120.50	-1.50	7.00	5.00
Cia. Ind. de Petroleos	285	281	281	-4	8.50	3.02
Cia. Ind. de Nitrogeno	127	125	125	-2	6.50	5.31
Cia. Sev. de Electricidad	232	226	226	-6	9.50	4.20
Cia. Telefon. Nal. de Esp.	295	284	284	-11	8.07	2.74
Dragados y Construcciones	580	575	575	-5	8.50	1.87
Ebro Azuc. Alcoholes	701	690	701	+11	13.90	1.94
Espanos del Zio	123	123	123	0	5.10	4.14
Fuertes Elect. Cataluna	230.50	230.50	231	+0.50	10.00	4.33
Galeries Preciados	315	315	315	0	11.47	3.64
Hidroelectrica Espasola	234.75	231.50	233	+2.25	10.00	4.29
Iberdrola	255	253	254	+2	10.00	3.52
Union y el Reik Espanol	680	680	680	0	12.00	1.74
Min. Sid. de Ponferrada	158	153	153	-5	6.65	3.25
S. A. C. Ros	193	191	191	-2	5.10	2.67
S. E. Auto. Turismo Seat	280	285	290	+5	9.35	3.22
Asileries Espanol	72.50	72	72	-0.50	4.25	5.90
Sad Met Duro Felguera	71.50	71	71.25	+0.25	8.00	7.00
Celosa Espanola Sniace	155	151	151	-4	8.00	5.29
Explosivos R.T.	270	266	266	-4	10.30	3.83
Simot	845	834	834	-11	10.78	1.28
Banco de Santander	240	240	240	0	10.78	1.28

Par values: Ptas.500 except * Ptas.250, * Ptas.150, * Ptas.1,000.

Source: Banco Central Madrid.

AUSTRALIAN WEEKLY LIST

Stock	High	Low	Close	Week's Change	Div.	Net
Adelaide Newsprint	11.60	11.50	11.50	-0.10	1.00	1.70
Adelaide Paper	11.60	11.50	11.50	-0.10	1.00	1.70
Adelaide Textile	11.60	11.50	11.50	-0.10	1.00	1.70
Adelaide Wool	11.60	11.50	11.50	-0.10	1.00	1.70
Adelaide Coal	11.60	11.50	11.50	-0.10	1.00	1.70
Adelaide Iron	11.60	11.50	11.50	-0.10	1.00	1.70
Adelaide Steel	11.60	11.50	11.50	-0.10	1.00	1.70
Adelaide Copper	11.60	11.50	11.50	-0.10	1.00	1.70
Adelaide Zinc	11.60	11.50	11.50	-0.10	1.00	1.70
Adelaide Lead	11.60	11.50	11.50	-0.10	1.00	1.70

CRUISES TOURS—SOVEREIGN

CRUISES, joint owners of 14,770-ton Galaxy Queen, cruise ship, has appointed United Touring as its general agent in South Africa for the period 1971-72.

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CANADIAN WEEKLY LIST

Alb's Gas. Tr. Line A	47 1/2	47 1/2
Argus Corp. Ltd.	1416	114
Ashtabula Copper	1676	1676
Aspen Pulp	2 1/2	2 1/2
Br. Columb. Tel.	60 1/2	64
Can. & Dom. Sugar	30	29 1/2
Can. Iron Foundry	12 1/2	13 1/2
Can. Lumber	12 1/2	13 1/2
Can. Farm. Mort.	14 7/8	14 7/8
Can. Investment Fund	4 1/2	4 1/2
Can. Dist. Int. Co. P.	23 1/2	27 1/2
Can. Petroleum P.	22 1/2	28
Canwest Exploration	18 40	8 60
Can. Pac. Int. Co. P.	11 00	11 00
Can. S. Bell Tel. Co.	18 1/2	18 1/2
Dom. Foundries	24 3/4	23 1/4
Dom. Stores Ltd.	13 1/4	13 1/4
Dom. Textile Co.	17 1/4	18 1/2
Fraser Co.	11 1/2	15 1/2
Procter Ltd.	0 23	0 28
Great Lakes Paper	15	16 1/4
Imperial Canada	17 1/2	17 1/2
Klondike Copper	15 3/8	13 3/8
Lamont John	25	25
Levander Mining	37 1/2	38
Nat. Drug & Chemical	17	17 1/2
N. Canadian Lbr.	11 1/2	6 50
Oakwood Pk.	11 03	11 00
Parmco Gas & Oil	0 55	0 55
Stamberg "A"	18 1/2	17 1/2
S. Can. Lbr.	17 1/2	17 1/2
Tech. Corp. Ltd.	50	5 95
Traders Trst. Ltd.	13 1/2	18 1/2
Western Pulp	15 1/2	16 1/2
* See 1st Section *		

ENGINEERING AND METAL—General—Contd. HOTELS AND CATERERS—Continued

ENGINEERING AND METAL—General—Contd.										HOTELS AND CATERERS—Continued									
Divisions Usually Paid	Stock	Quoting Month	When Issued	Divi- dend Rate	Time to Maturity	Yield	Price	Paid	Dividends Usually Paid	Quoting Month	When Issued	Divi- dend Rate	Time to Maturity	Yield	Price	Paid			
Max. Sec. East's Virginia	1889	10	1889	5.75	6	4.1	—	—	E. J. M.	1889	10	1889	5.75	6	4.1	—	—		
Sept. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Sept. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—	Nov. Max. West Virginia	1889	10	1889	5.75	6	4.1	—	—		
Nov. Max. West Virginia	1889	10	1889	5.75	6														

[illegible][illegible][illegible][illegible]

March 10th (Wed) 10	18	11.67	—	—	—	Nov. John Jay Crowe	126	77	22	2.3	4.4	9.9
March 11th (Thurs) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 12th (Fri) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 13th (Sat) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 14th (Sun) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 15th (Mon) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 16th (Tue) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 17th (Wed) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 18th (Thurs) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 19th (Fri) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 20th (Sat) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 21st (Sun) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 22nd (Mon) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 23rd (Tue) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 24th (Wed) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 25th (Thurs) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 26th (Fri) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 27th (Sat) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 28th (Sun) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 29th (Mon) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 30th (Tue) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
March 31st (Wed) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 1st (Thurs) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 2nd (Fri) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 3rd (Sat) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 4th (Sun) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 5th (Mon) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 6th (Tue) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 7th (Wed) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 8th (Thurs) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 9th (Fri) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 10th (Sat) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 11th (Sun) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 12th (Mon) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 13th (Tue) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 14th (Wed) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 15th (Thurs) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 16th (Fri) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 17th (Sat) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 18th (Sun) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 19th (Mon) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 20th (Tue) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 21st (Wed) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 22nd (Thurs) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 23rd (Fri) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 24th (Sat) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 25th (Sun) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 26th (Mon) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 27th (Tue) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 28th (Wed) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 29th (Thurs) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
April 30th (Fri) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 1st (Sat) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 2nd (Sun) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 3rd (Mon) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 4th (Tue) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 5th (Wed) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 6th (Thurs) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 7th (Fri) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 8th (Sat) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 9th (Sun) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 10th (Mon) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 11th (Tue) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 12th (Wed) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 13th (Thurs) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 14th (Fri) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 15th (Sat) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 16th (Sun) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 17th (Mon) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 18th (Tue) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 19th (Wed) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 20th (Thurs) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 21st (Fri) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 22nd (Sat) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 23rd (Sun) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 24th (Mon) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 25th (Tue) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 26th (Wed) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 27th (Thurs) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 28th (Fri) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 29th (Sat) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 30th (Sun) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
May 31st (Mon) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 1st (Tue) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 2nd (Wed) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 3rd (Thurs) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 4th (Fri) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 5th (Sat) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 6th (Sun) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 7th (Mon) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 8th (Tue) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 9th (Wed) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 10th (Thurs) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 11th (Fri) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 12th (Sat) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 13th (Sun) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 14th (Mon) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 15th (Tue) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 16th (Wed) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 17th (Thurs) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 18th (Fri) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 19th (Sat) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 20th (Sun) 10	18	11.67	17	1.5	8.6	7.7	Nov. May Clayton Sen 104	24	5.5	10	1.9	5.9
June 21st (Mon) 10	18	11.67	17									

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For Notes, see Page 13

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